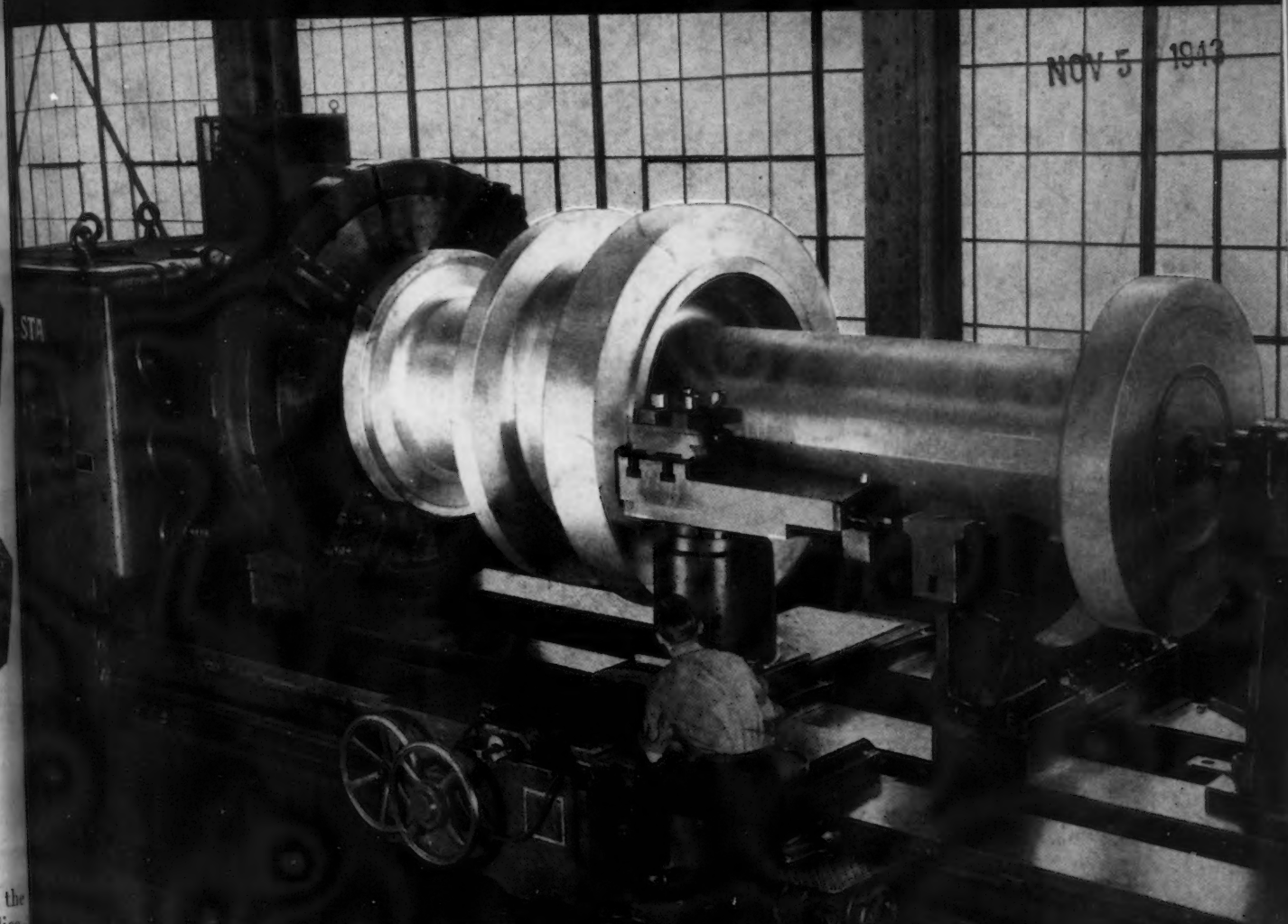


NOVEMBER 4, 1943

The

# IRON AGE



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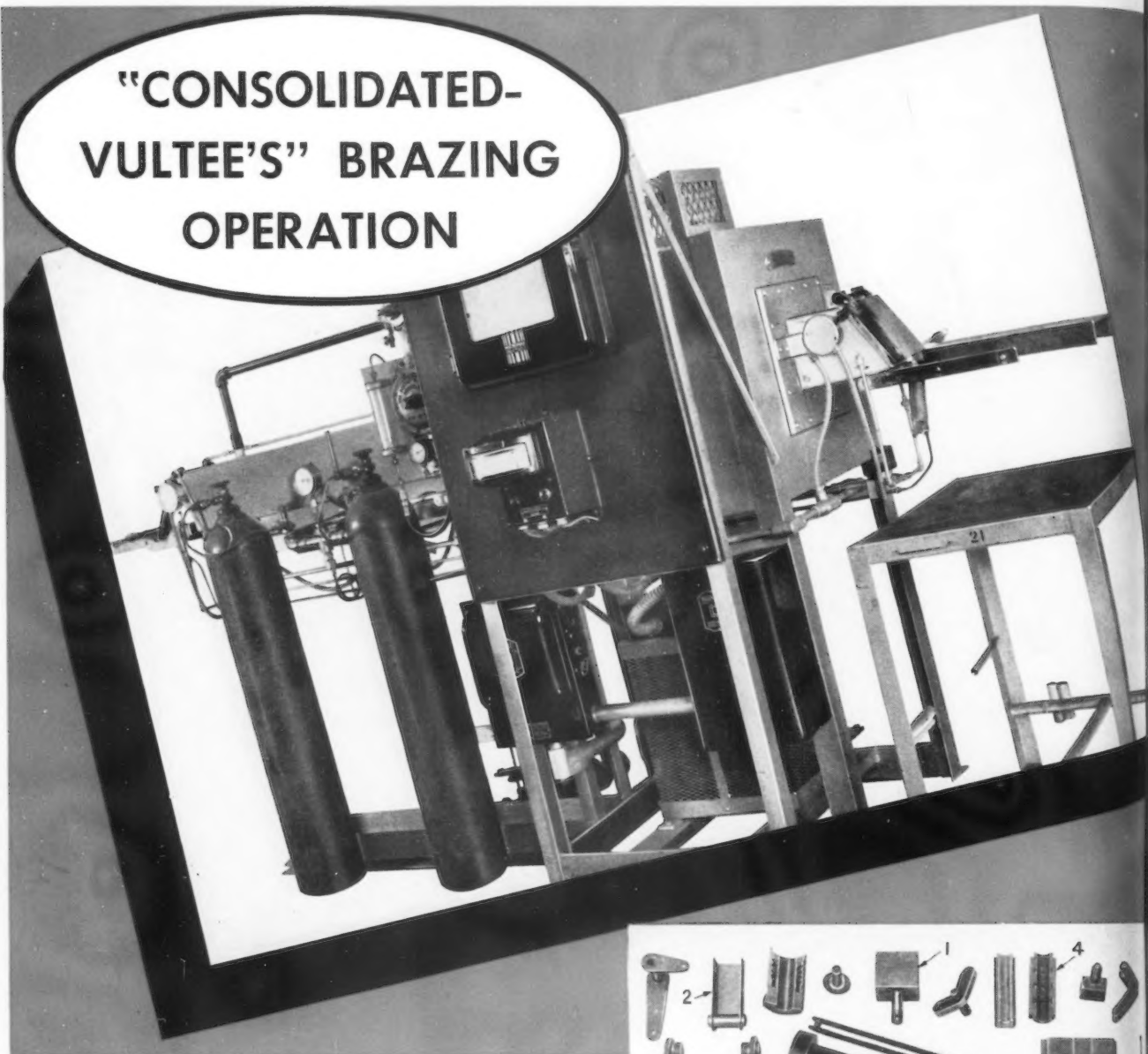


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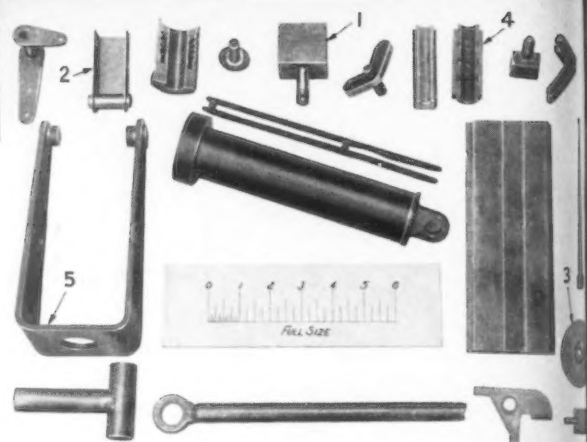


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Nov. 4, 1943

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## One Dimensional Thinking

**A**BRAHAM LINCOLN thought pretty well of American common sense. It was he who phrased the expression: "You can fool some of the people all of the time and all of the people some of the time but you can't fool all of the people all of the time."

This aphorism has stood the test of time for more than half a century, but it has recently been badly dented through a bumping by bureaucracy. Perhaps that is understandable because the brand of bureaucracy which has been rampant in Washington since 1933 has collided damagingly with many an American tradition.

The Lincoln tradition, however, we thought was one that was shock proof, even to the impact of one dimensional thinkers. It remained for the Lincoln penny to put that one on the scrap pile.

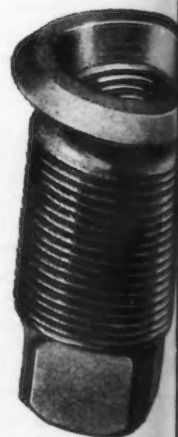
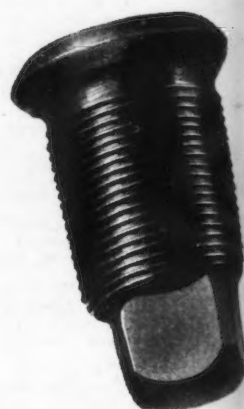
The Lincoln penny has fooled everybody. No one, for example, is harder to fool than a Fifth Avenue bus conductor in New York City. A 30-min. boiled egg is a softie by comparison, especially in the specialty of sizing up dimes. Yet it was only a week ago that one of these expert dime detecting specialists spent several minutes in trying unsuccessfully to help a lady insert one of the new steel Lincoln pennies into the bell ringing gadget that registers the fares on his avenue perambulating chariot.

Far be it, of course, from The Iron Age to throw cold water on new uses for steel. But in the design of new pennies as with any new product, one dimensional thinking is disastrous. It is necessary, for instance, to think not only of the good that the new product will do but also of the harm that it might do before you go ahead into production and flood the market.

Assuming that I am an average sample of gullibility, and on the basis that I have been short changed to the tune of \$1.40 during the past few months by accepting Lincoln pennies in change for dimes, this brain spasm on the part of the esteemed lady director of the mint and Democratic vice-chairman has cost the American public no less than \$182,000,000. They tell me that there are quite a number of people, in fact, who make a fair living and a 900 per cent profit by collecting the new Lincoln pennies and passing them out as dimes.

We can't blame this unfortunate situation on Congress, the steel industry, the CIO or the AFL for they had nothing to do with it. It was purely a case of one dimensional thinking which is typical of so much of the bureaucratic thinking and acting of today. It is true that these deceptive tokens are to be replaced, but the harm has been already done. Or perhaps we should say the good instead of the harm because if the Lincoln penny teaches America the danger of one dimensional bureaucratic thinking, the game will be worth the candle.

*J. H. Van Deventer*



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● Antrim Iron Co., Grand Rapids, Mich., has just terminated all charcoal pig iron and wood chemical operations, after operating since 1886. Manpower shortage in the woods to put up chemical cordwood accelerated the action. Antrim may sell its facilities to Mexico or South America interests.

● The only Michigan charcoal blast furnace now operating is that at Mewberry.

● Announcement will soon be made on the moving of the Penbroke, Florida, elementary phosphorus blast furnace to Rusk, Texas, for the making of some 150 tons of charcoal iron daily. Charcoal equipment will come from the Delta (Michigan) Chemical Co., which some time ago ceased making charcoal iron.

● Sixteen cable cutters are now being fitted along the leading edge of British bombers, as protection against barrage balloons. Devised by James Martin, the action is such that when the cable hits the leading edge it slides into a small "gate", moving a trigger as it enters and so firing a cartridge sunk into the base of the cutter; this drives forward a "chisel" which instantaneously cuts the cable.

● Reich Marshal Goering has suffered another curtailment of his powers, with the transfer of aircraft production to Speer's new Ministry of Armament and War Production. In a recent conference on design and production, Goering, who previously dominated such meetings, was neither present nor mentioned.

● Although the papers said Mussolini was rescued by German parachute troops, recent German reports indicate that the 18 key members of the German Security Police who sprung the Duce, reached the plateau by a glider.

● Hardness gradients and distribution of internal stresses of armor piercing shot are being tested non-destructively by a new electronic device, the Cyclograph, which evaluates, with one reading, combinations of qualities adding up to "acceptability". In other applications, the machine sorts small samples automatically at speeds as high as 5 per sec.

● Filtering of air, gases, liquids and sludges promises a big field for glass fibers with their low resistance to flow of liquids and wide modifications of porosity through fiber size and density of packing. Another potential processing use is evaporation, the fibers being used to increase the film surface of the liquid.

● High strength steel castings for aircraft parts, hitherto impossible to obtain in the shapes, sizes and quality desired, will soon be available in production quantities.

● The urgency with which the U. S. and Canadian governments have been searching out and developing new mines in Canada has dropped markedly. Any increase in copper and zinc ore output will now come from diversion of manpower to mines operating on reduced schedules.

● While many builders talk blithely of planes of 250 and 350-ft. wing spans, some designers are switching back to the belief that medium size aircraft will be the most economic. As in ships, the "S.S. Queen Mary" is dramatic, but the squat freighters pay the dividends.

● Higher speed and power requirements stemming from experimental milling tests at greatly increased production rates in West Coast aircraft plants render present milling machines obsolete, with complete redesigning probable.

● Turbine bucket blades for aircraft turbo-superchargers are now being precision cast from a non-ferrous, non-machinable material instead of being forged from a high alloy steel. Buckets are fusion-welded to the rotor. This material resists exhaust gas temperature of 1500 deg. F. and centrifugal force better than mechanically held steel buckets.

● The War Department, showing what OPA ceiling prices mean in terms of producers with multiplied volume and good equipment, cites as "truly typical" 128 per cent, 109 per cent and 239 per cent increases on rates of profits on sales of standard products of three companies. The base used is a 1936-39 average.

● The average renegotiation settlement is made in 30c. dollars, with an average of 10 per cent of every adjustment paid for in tax credits. Cost of administering renegotiation is 1/3 of 1 per cent of the gross gain to the government.

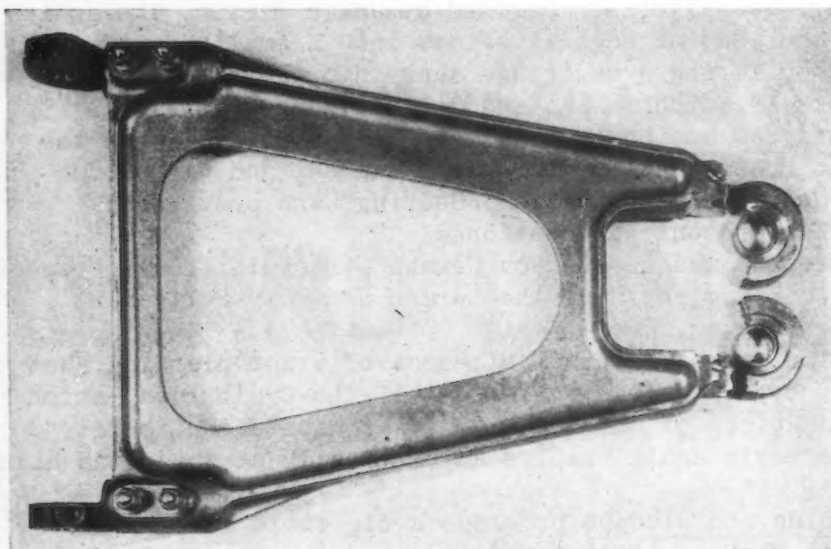
# Castings in Aircraft C

**T**HE use of castings in the primary structure of aircraft has long been looked upon with disfavor. This condition existed for several reasons. First, most casting materials had an inherently low strength; second, castings had a low

resistance to repeated loadings, in other words, a very low endurance limit; third, foundry techniques had not been developed to a point where all castings of a particular lot could be depended upon to show the consistently high strength characteristics

required of an aircraft structural part. This last condition brought about a requirement that all castings be designed to provide for at least 100 per cent overstrength so that there would be at least a reasonable assurance that the castings would stand up under the design conditions. All this imposed a very severe weight penalty against the use of castings in aircraft.

It has been roughly estimated that in general a fitting designed as an aluminum alloy casting would weigh approximately four times as much as the same fitting designed as an aluminum alloy forging. The basis for this was that the material in each case had about the same specific gravity, but the tensile strength of the casting material was one-half that of the forging material and, in addition, had to provide for 100 per cent overstrength. The value of a pound of weight saving on an airplane had been variously estimated as ranging from several dollars to



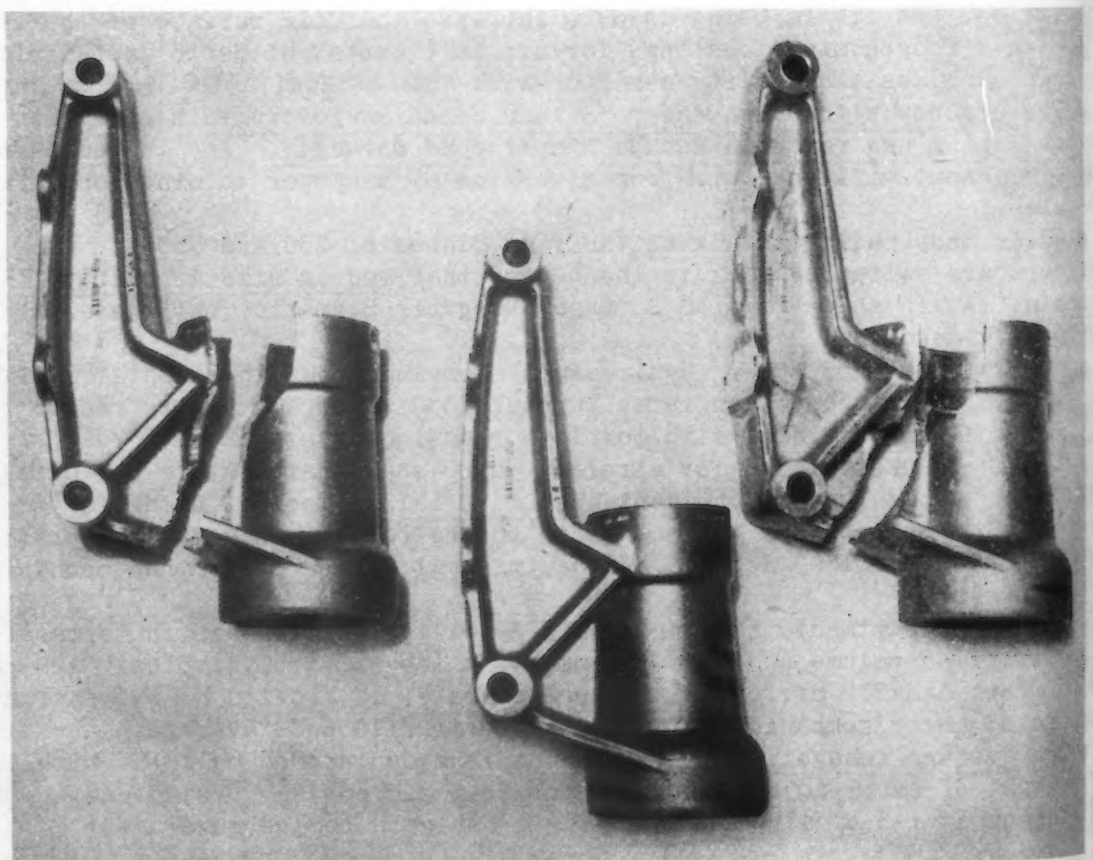
ABOVE

**FIG. 1**—This tail-wheel link is made of B195-T6 casting with malleable iron lugs pinned at one end to provide strength where insufficient space prevented the use of aluminum alloy. This part as well as most of the others shown in the accompanying illustrations are in the fractured conditions. These parts have been tested to destruction.

o o o

RIGHT

**FIG. 2** — Housing for tailwheel spindle bearings. This part is cast in B195-T6. By careful designing this part weighed no more than the original aluminum alloy forging.



# Construction

By DANIEL M. DAVIS

Weights and Structures Supervisor, Vultee  
Field Division, Consolidated Vultee  
Aircraft Corp.

several thousand dollars, depending on the type of airplane involved.

Under wartime emergency conditions, economic questions take second place over production problems. Overworked facilities for producing aircraft fittings as forgings and extrusions soon became a very serious bottleneck. This bottleneck had to be broken regardless of cost. One of the means for improving the condition was the extended use of castings. Thus the program of substituting castings for forgings and extrusions was begun at the Vultee Field Division of the Consolidated Vultee Aircraft Corp. On a training airplane a slight increase in weight is not nearly as serious as it would be on a combat airplane where every pound is measured in terms of ammunition, fuel and maneuverability. Thus it was obvious that the war effort could best be helped by leaving the forging and extrusion producing facilities available to the manufacturers of combat airplanes as much as possible.

It was soon found that redesigning parts as castings without letting the weight get out of hand was a task not to be taken lightly. In one particular group there were nearly 50 fittings involved, many of these being very small, so that the total weight involved was only about 1½ lb. Several large fittings such as the main landing gear fitting and the main wing attachment were not changed because space restrictions were such that castings interchangeable with the forgings could not be developed readily.

When first considered, it seemed that the increase in weight would be prohibitive. This was a condition that would have to be alleviated because not only was the weight critical, but some of the increase in weight would be in a location that would very seriously interfere with the balancing conditions of the airplane. The only answer for this situation was to concentrate very seriously on the detail design, paying strict attention to the weights of those items which were most critical from a balance standpoint. A particular group of forgings weighing 18¼ lb. was redesigned

**... In order to overcome the bottleneck in forging and extrusion facilities, the Vultee Field Division has initiated a program of substituting castings wherever possible. The use of radiography and tests to discover optimum pouring temperatures have greatly improved the quality of these castings. How these parts were redesigned to eliminate excess weight and preserve the balance of the airplane are also described.**

as aluminum alloy castings with an increased weight of only slightly over 7½ lb. Thus, the final weight of this group of parts was 1.4 times the original weight of the castings instead of four times the weight as is often normally expected.

Along with the design, the choice of material was carefully considered. For obvious reasons, the number of different materials used had to be limited to as few as possible. The final choice resulted in the adoption of three alloys—two aluminum and one iron. The aluminum alloys chosen were 356-T6 and B195-T6. The iron alloy chosen was high-grade malleable iron. Aluminum alloy 220-T4 was considered, but because of the difficulty in casting this material, particularly in small sections and in permanent molds, this material was eliminated in the early stages of design. At the time, magnesium alloys were scarce and were therefore also

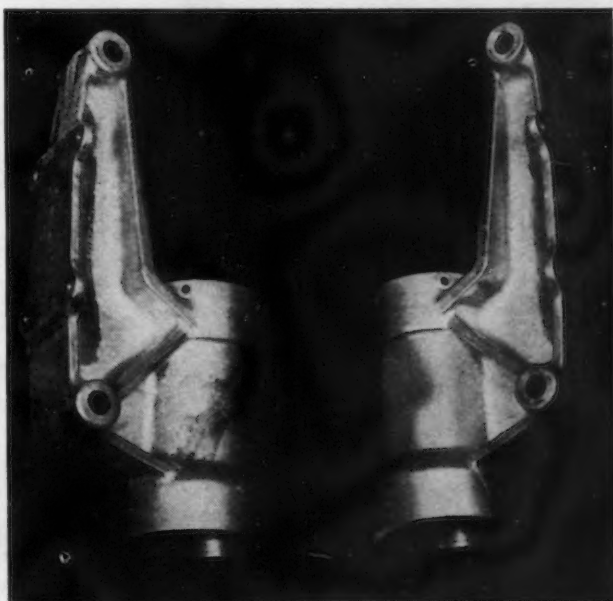
not considered. The physical properties of the materials used are listed in the table below:

Material	Tensile Strength Lb. Per Sq. In.	Tensile Yield Lb. Per Sq. In.	Elongation Per Cent in 2 In.
B195-T6.	42,000	30,000	3.0
356-T6 ..	33,000	20,000	3.0
Malleable Iron ..	70,000	50,000	8.0

## High Strength Characteristics

Test bar samples of each lot of castings proved that the castings were consistently higher in strength than the minimum specified in the table. The 356-T6 alloy was used wherever possible because experience has shown that this alloy is one of the most versatile aluminum alloys available. It casts very readily even in small intricate sections. The strength characteristics are good and are consistent with each batch of

FIG. 3—In this original design of the casting shown in Fig. 4, the points of stress concentration were eliminated in the cast part.



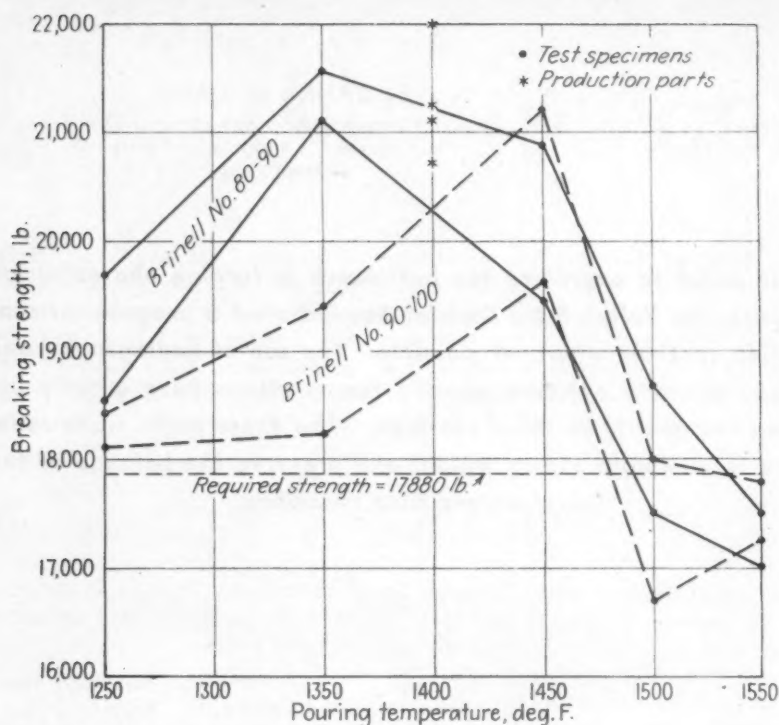
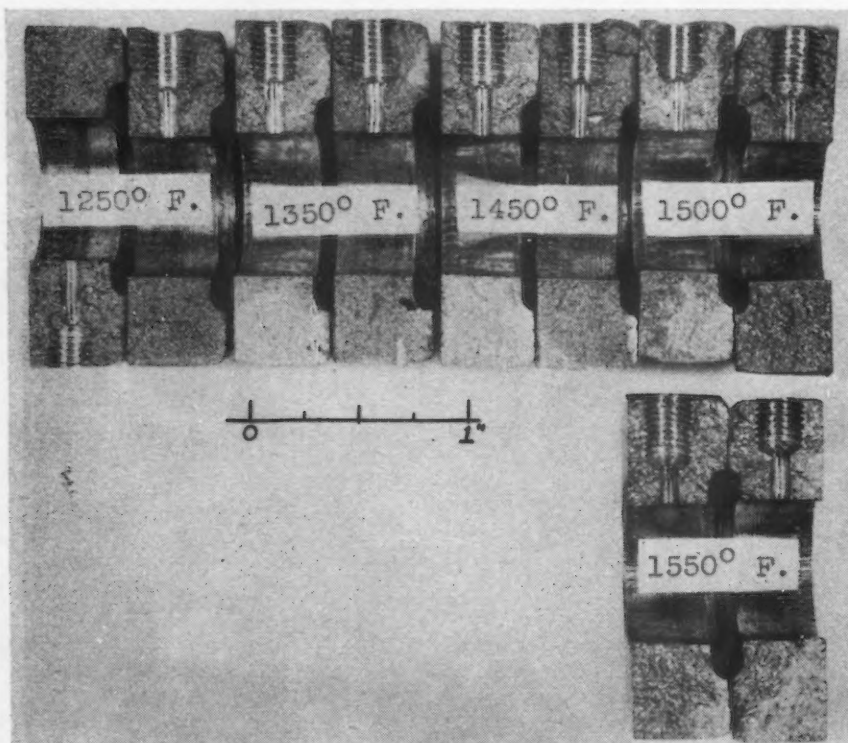


FIG. 4—Effect of pouring temperature on the strength of the tailwheel link shown in Fig. 1.

castings. It has also been found that this alloy withstands vibration fairly well. The B195 alloy is used wherever strength characteristics higher than that shown by the 356 alloy are required. The malleable iron castings have very similar strength characteristics to the aluminum alloy forg-

ings which they replaced and are being used only in places where the additional material required to maintain strength in aluminum alloy castings would not give parts that were interchangeable with those already in service. This meant that for these particular parts a weight penalty of

Fig. 5—Effect of pouring temperature on the fracture of the part illustrated in Fig. 1.



nearly twice the weight of the original part had to be accepted.

Sometimes a compromise could be made. A typical example of this is shown in Fig 1, where the space allowed for the material around a bolt in the lug at one end of this part was such that enough material in an aluminum alloy casting could not be designed into this part. To make the part completely of malleable iron would result in a prohibitive weight penalty since this part was practically at the end of the moment arm of the airplane and would very seriously affect its balance.

The compromise was in using malleable iron castings as lugs designed as small as possible, pinned to a B195-T6 permanent mold casting for the bulk of the structure. The net result was a part which weighed practically no more than the original aluminum alloy forging. Keeping the weight down on this part is further proof that the war industries are doing what was once thought to be the impossible, since the original forging was considered to have been efficiently designed.

Another part in which no weight penalty could be accepted is shown in Fig. 2. This is the housing for the tail wheel spindle bearings. The loads imposed are very high. By very carefully proportioning the material and eliminating all possible excess material, this part also weighed about the same as the original forging. A small error in detail design showed up in the test of the first parts. The flanges connecting the lower portion of the arm to the bearing housing were therefore widened to help alleviate the stress concentration. Fig. 3 shows the results of the tests on the first design. Fig. 2 shows the final design.

Many castings were made the same size and shape as the original forgings because the forgings were overstrength and because it was impractical from a production standpoint to make them much smaller.

Also, in the design of castings it was kept in mind that a casting takes its shape in the form of a liquid as differentiated from a forging where solid material is shaped. Thus, undercuts and cavities in low stressed areas were used to help keep weight down.

One of the contributing factors in the successful use of castings in aircraft structures is the increased use of X-ray inspection in the development of foundry technique. Not so

long ago castings were almost consistently of poor quality. What little X-ray control was used was limited to a few foundries. X-ray inspection would reveal castings consistently full of blow holes, dross, porosity, and shrinkage, giving castings a very poor reputation as far as structures were concerned.

### Quality of Castings Improved

A comparison of radiographs of present-day castings with those of two or three years ago very clearly shows the tremendous improvement in quality. Castings with defects are now the exception instead of the rule. The foundries have been very co-operative with the aircraft manufacturers in developing these high-strength, consistently sound parts. Increased production demands have warranted the use of permanent molds in place of sand molds. This, too, contributed greatly to the increased quality.

When drawings of castings were released to the foundry and the first castings were made from a mold, many defects were of course present. These were quickly corrected by the use of radiographs for inspection and all production runs of castings are now of high quality. These defects were due partially to the design of the casting because of the lack of familiarity of the engineers with foundry technique. Thus, parts showed considerable shrinkage in corners where radii were too small or changes of section too great. Foundry techniques also had to be worked out to eliminate porosity and cavities as well as shrinkage.

A very interesting situation occurred with the aluminum alloy cast-

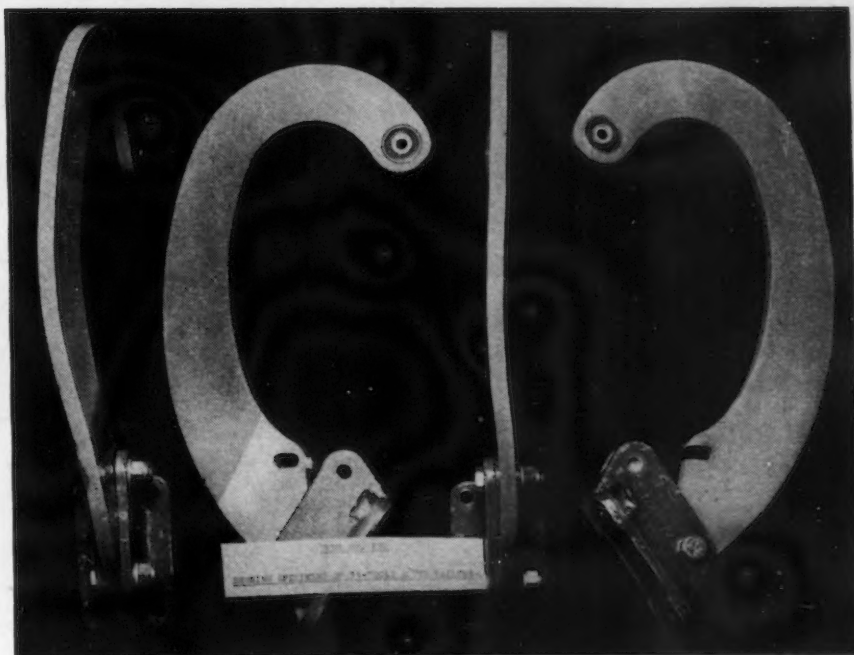


FIG. 6—Hinge brackets consisting of a B195-T6 aluminum alloy casting for a base and aluminum alloy sheet for the arm to avoid casting a long flexible part.

ing of the part shown in Fig. 1. When testing this part which had been cast with generally accepted foundry techniques, it was found that the lugs were greatly understrength. The material consistently would not develop over one-half of its specified strength. There was nothing that X-ray inspection or microscopic inspection could reveal that showed the cause of this weakness. The hardness of the material seemed to have no effect on the strength.

After trying various methods to eliminate the trouble, a series of castings was poured at various pouring temperatures ranging from 1250 deg. F. to 1550 deg. F. Four castings were

poured at each temperature. Two of these were heat treated to give a Brinell hardness reading of approximately 80 to 90, while the other two were given a heat treatment to obtain a Brinell hardness number of approximately 90 to 100. These were tested and the results are shown in Fig. 4.

From the results shown on the chart it was decided that the optimum pouring temperature was about 1400 deg. F. This is higher than is considered good practice for B195 material. To date no one has been able to explain the reason for this variation in strength as shown in the chart. Parts which were

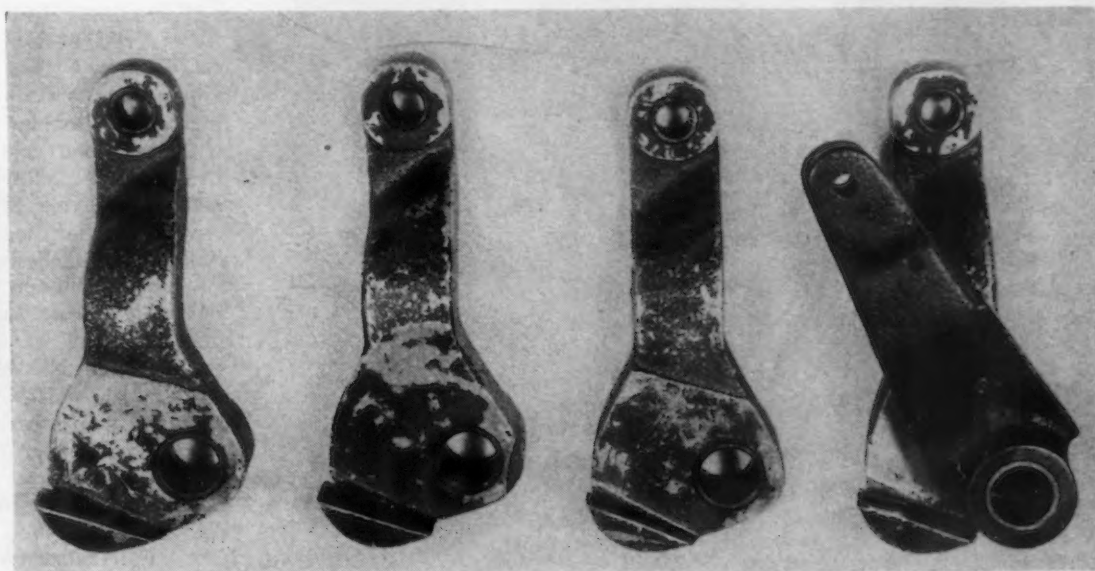


FIG. 7—These brake operating levers were made of malleable castings. They are considerably heavier than the original aluminum alloy forgings but lack of space prevented the use of aluminum alloy castings.

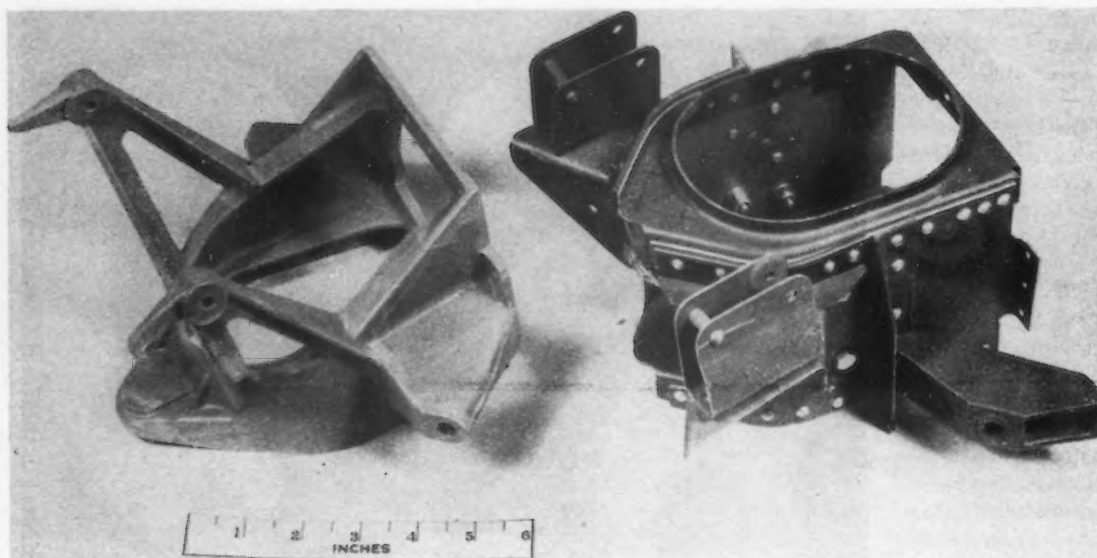


FIG. 8—The 356-T6 aluminum alloy casting shown at the left replaces a very complicated built-up part shown at the right. The original part consists of 18 individual parts held together by bolts and rivets.

poured at 1400 deg. F. were tested and the strength is indicated by the mark on the chart of Fig. 13. The fracture of these parts is shown in Fig. 5 and indicates a variation in the crystal structure which evidently affected the strength.

Some parts, as shown in Fig. 6, were considered too long and flexible to be reproduced as castings. These were designed with an aluminum alloy bracket for a base and an aluminum alloy sheet to form the arm.

The malleable iron castings were, in general, designed in much the same manner as the aluminum alloy cast-

ings. There was some difficulty at first in working out the foundry techniques to produce consistently sound castings of small parts in a material generally used only for large bulky parts. A typical malleable iron casting is shown in Fig. 7. A total of 12¾ lb. of aluminum alloy parts was replaced with malleable iron castings. This imposed a weight penalty of nearly 23 lb. This weight penalty was accepted in the interest of an overall increase in the production of vital war planes, and also to maintain interchangeability with previously fabricated parts.

Another application of a casting is shown at the left in Fig. 8. This very complicated part was designed to simplify fabrication. The original design, shown at the right of Fig. 8, used 18 different parts, not counting any of the bolts and rivets used to hold all of the parts together. The advantages of having a one-piece part are obvious.

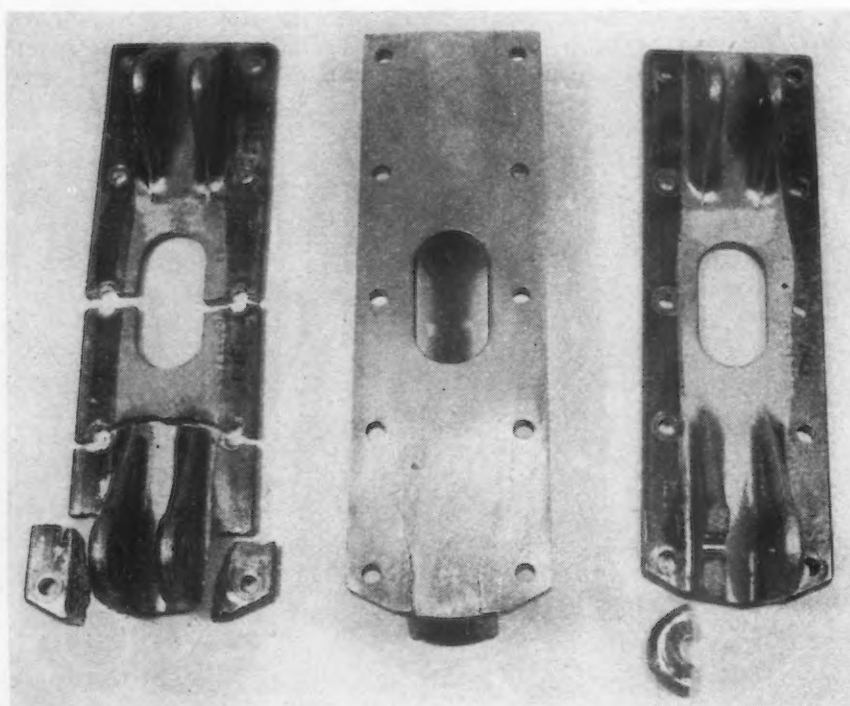
#### Castings Replace Extrusions

Following along the same line, extrusions had become as critical as forgings. While many of these could be converted to sheet metal, some were changed to castings. Fig. 9 shows a typical example of a part that once was machined from a piece of extrusion and is now made as a casting. The saving is not only in critical material, but also in machining time which is not to be overlooked.

All structural parts are submitted to static tests to prove their strength. The parts for testing are usually the three worst parts from the first 100 castings made. The selection is made from X-ray films of these 100 castings. All castings are required to withstand one and one-half times their design loading. Castings from materials having greater than 3 per cent elongation may, under certain conditions, be designed without requiring the one and one-half test factor. The X-ray inspection of castings is based on the test results. Castings which have a strength from one and one-half to three times the load are subjected to an X-ray inspection of 25 per cent of the parts selected at random. Parts that are from three to ten times overstrength are X-ray inspected 10 per cent. If

(CONTINUED ON PAGE 154)

FIG. 9—Tailwheel linkage attachment bracket made as a D195-T6 casting. This part was formerly machined from an aluminum alloy extrusion involving considerable material waste.



356-T6 alloy at the a very built-up at the original of 18 parts held bolts ets.

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# Electronic Sorting and Testing

**A** RECENTLY developed electronic device, the Cyclograph, provides a unique method of sorting and performing non-destructive qualitative and quantitative metallurgical tests on ferrous and non-ferrous materials. The machine, designed by Allen B. Du Mont Laboratories, Inc., Passaic, N. J., has been adapted to checking, evaluating and sorting of materials by such factors as machinability, toughness, internal stresses, structure, analysis, case depth, plating thickness and heat treatment.

The Cyclograph utilizes the principle that the metallurgical properties noted above cause variations in the core loss of a tuned pick-up coil which surrounds the piece under test. These variations affect the shape of an easily interpreted visible pattern or oscillogram displayed on a cathode-ray tube indicator screen (Fig. 1). By means of these pattern variations, a semi-skilled operator can determine differences in metallurgical properties of a number of ostensibly similar parts.

Where large quantities of samples are involved, such as in actual production and production test routine, the machine can be adapted to automatic sorting at speeds as high as 5 pieces per sec.

By inspection of the core loss characteristics of a metal at three, for example, properly chosen frequencies, the Cyclograph is capable of breaking down a given lot into smaller lots. Each of the pieces in each of these smaller lots will now have reasonable constant metallurgical properties except for the single property under test. After this preliminary selection test, the Cyclograph will then evaluate for each of these lots the single metallurgical property under test.

The procedure followed in sorting SAE and NE steels has been to select

two or more frequencies which give a correlation between the instrument readings and the characteristic of the metal which is to be identified.

To do this, a graph must be plotted which shows the relative instrument readings as a function of the frequency and proper test frequencies chosen from this graph. Representative curves are shown in Figs. 2 and 3.

It can be seen that if an attempt were made to separate two different steels at any one given frequency, sooner or later some pair of steels which would give the same reading would be encountered. This is true of all types of magnetic testing using only one reading. It can also be seen that measurements at three frequencies of 3, 10 and 50 kilocycles are sufficient to establish definitely which curve any particular steel lies upon.

If it is desired to sort any two given steels according to analysis in a cer-

tain stage of heat treatment, a "measuring frequency" will be chosen at that point showing the widest difference in reading for the particular steels to be sorted. The standardizing frequencies will be the other two frequencies used.

To perform a practical separation of two steels, a sample of each of the two steels is obtained. A composite indication at two frequencies other than the measuring frequency furnishes a reading typical of each grade of steel. This is the standardizing reading. As each piece of steel is put in the instrument, its standardizing reading is taken. If the standardizing reading is one of the two values expected, the measuring indication shows which one of the two steels is the particular piece. If the standardizing reading is not one of the two expected readings, the steel is neither of the two steels the instrument is supposed



**FIG. 1**—Checking the case hardening depth of roller bearings on the Cyclograph. The coil is contained in the square box, in which the pieces are placed. The pattern appears on one or the other of the cathode-ray tube screens being used. Checking and sorting can also be done automatically, on the production line, the satisfactory pieces falling into one box, the rejects into another.

to be sorting or else it is not in the expected state of heat treatment.

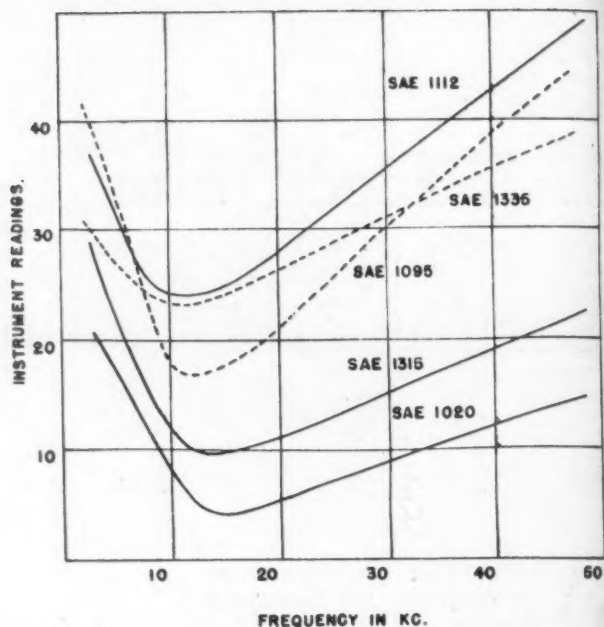
An automatic relay can be used in conjunction with the instruments in production sorting of small parts. This is only necessary where the quantity to be tested is large. The rate of sorting for small pieces, such as bullets or screws, is about 5 per sec.

### Armor Piercing Shot Test

In a suitable armor piercing shot, although hardness and stresses are not uniform throughout, a balance of internal stresses is reached. If a medium test frequency is chosen, a tough shot, in which the hardness gradient and distribution of internal stresses are as desired, gives a definite reading. If the hardness is higher or lower than desired, the reading will change because the relative values of core losses change. Similarly, increased internal stresses in any one area, as caused by having a surface layer under extreme stress, will greatly increase the high frequency losses which are only affected by changes in the surface layers of the shot. If the high frequency used is such that the field of flux penetration approximately coincides with the hardened zone of the shot, a very sensitive measure of stress distribution can be obtained.

In evaluating toughness of shot after heat treating, the instrument used on the hardened shot takes two standardizing readings at proper frequencies which establish that the shot is of the expected analysis and that heat treatment has not been erratic. A third or measuring frequency is used to determine the toughness or

FIG. 2—SAE steels as rolled, showing the relative instrument readings as a function of the frequency.



brittleness of the particular shot. These measurements can be done simultaneously or one after the other.

Low frequency measurements are successful in identifying pearlitic and spheroidized structures in bar stock. The most practical way of segregating bar stock as received, is first to separate pearlitic bars from spheroidized bars and then to grade spheroidized bars according to the per cent spheroidization, if desired.

### Case Depth Measurement

Several methods of quickly determining case depth by measurement of one or more magnetic or electrical properties are under development at present. All of these are compara-

tive methods. A standard piece with known case depth is first used to set the instrument. Case depth of other parts which are the same in analysis, heat treatment, size and shape may then be determined by substituting them in the instrument.

By careful design of test coils and proper choice of frequencies, a reliable indication of case depth can be obtained if the following procedure is carried out:

The case hardened parts must be inspected to insure that all parts being compared have approximately the same magnetic characteristics in their cores; groups having the same core characteristics can then be inspected for case depth if their temperatures are reasonably constant.

In practice, one instrument is used to inspect the core characteristics. Differences in analysis, heat treatment and internal stresses are indicated. The parts are divided into groups which show the same magnetic properties by this method of testing.

Each group is then tested separately on a second instrument. Once the instrument is set up to measure case depth on any given group of parts which have been segregated according to core properties, no further adjustments are necessary. The parts are placed in the test coil and the case depth read from the cathode-ray tube screen. Rate of testing depends upon the speed of the operator, who needs no more technical training than a Rockwell operator. A production rate of testing on one single type of part should be between 20 and 30 pieces a min.

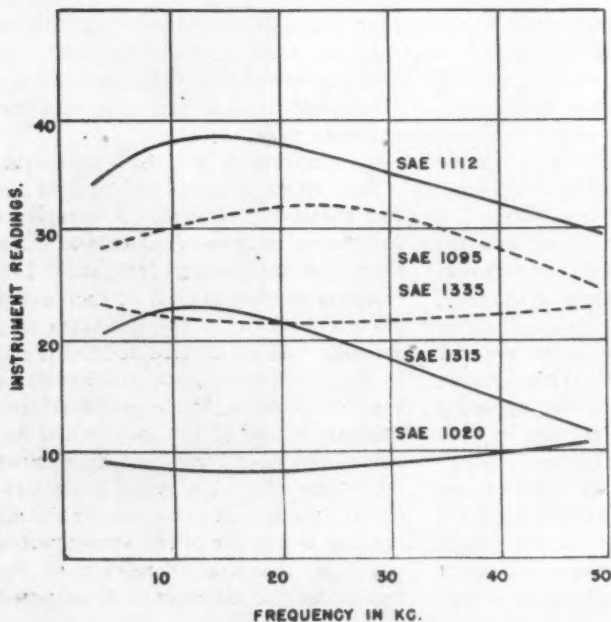


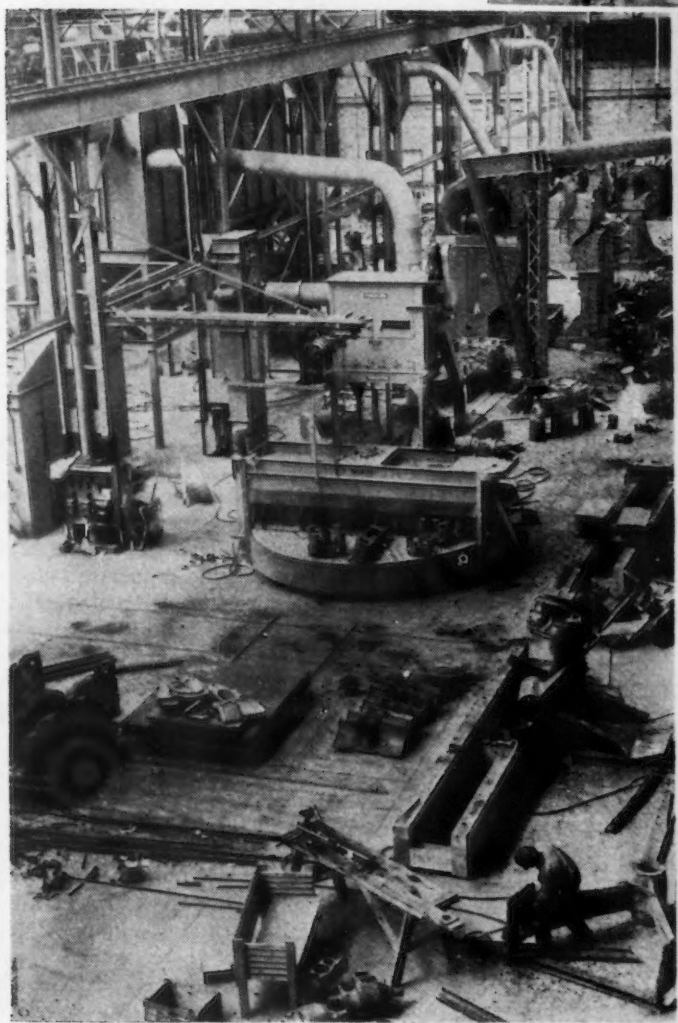
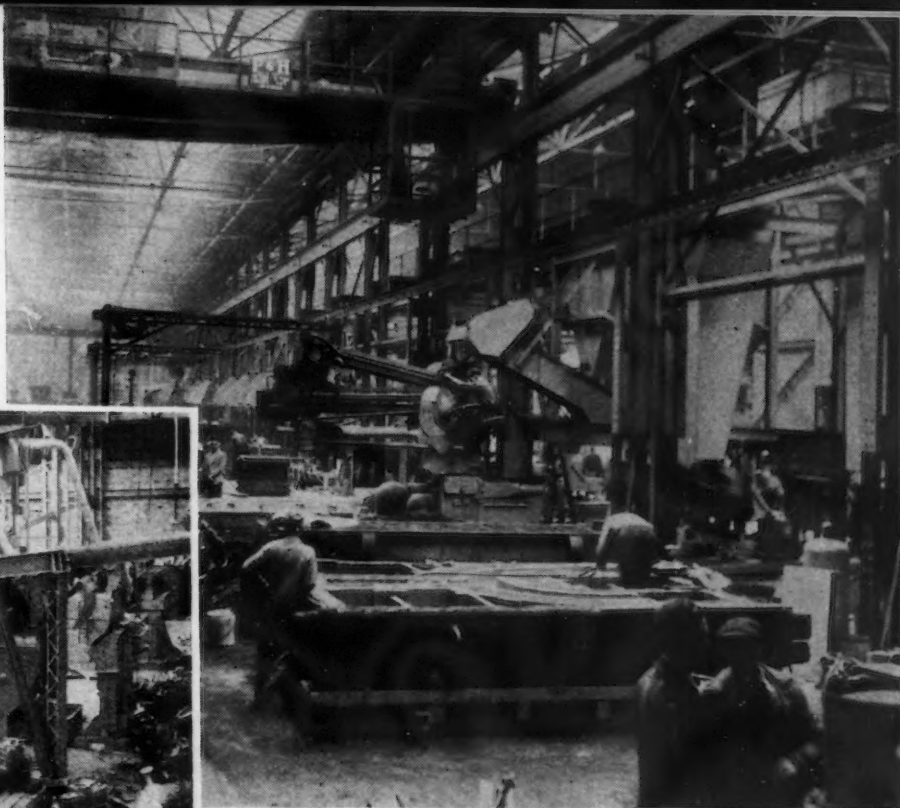
FIG. 3—SAE steels quenched and drawn, showing the relative instrument readings as a function of the frequency.

o o o

RIGHT

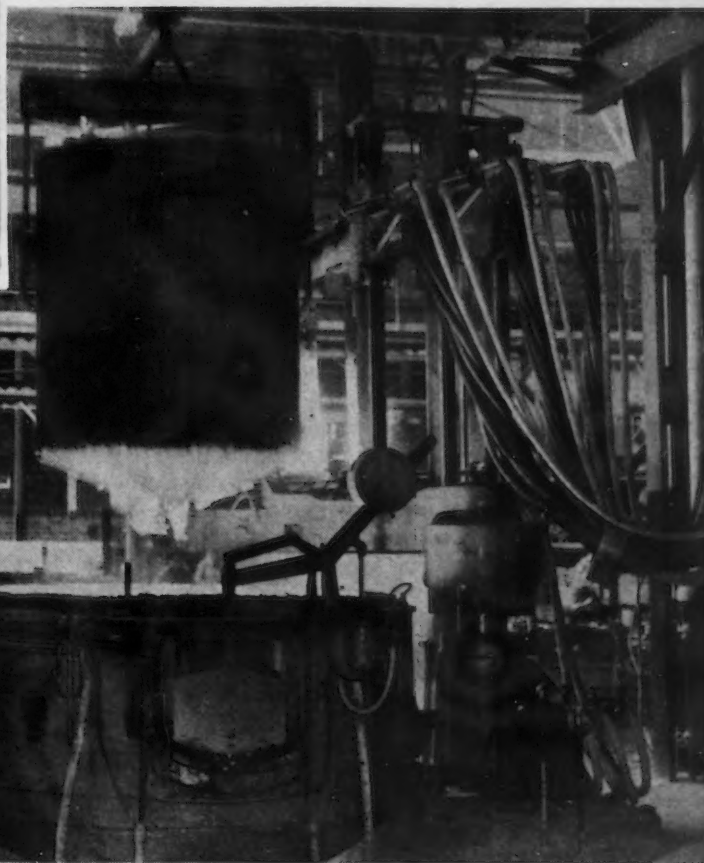
Cleaning of marine, aircraft, tank, gun and truck castings in the sand-blasting, chipping and grinding departments before heat treatment.

o o o



## Ordnance Casting on the West Coast

... Scenes at the new Pacific Car and Foundry Co. foundry, Renton, Wash., one of the most modern in the country.



ABOVE

Speedslinger, throwing sand into molds.

o o o

RIGHT

Charging melting furnaces.



# Glass Fibers—

## A New Engineering Material

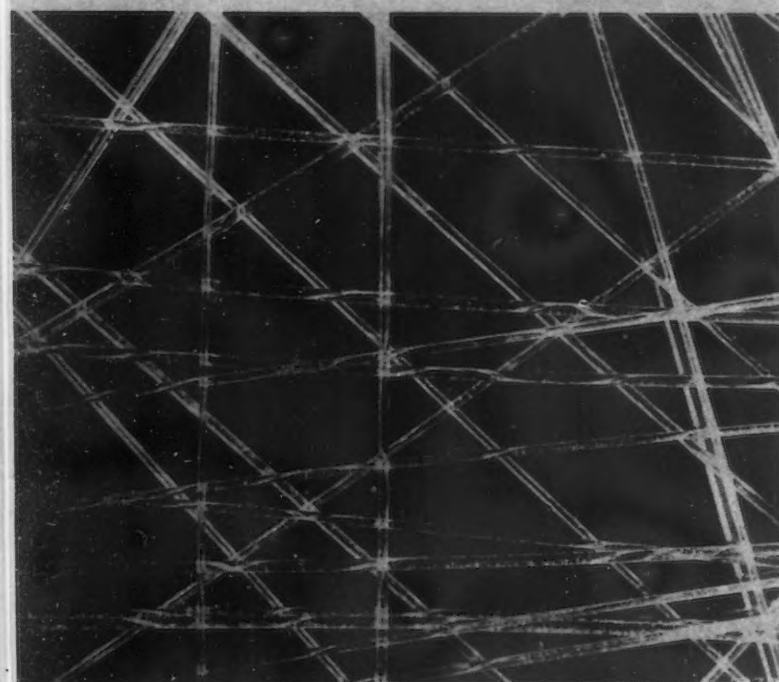
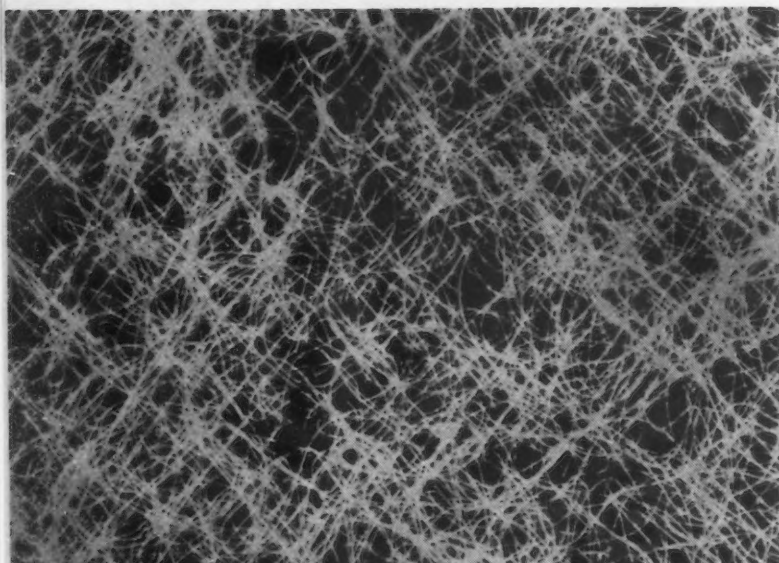


FIG. 1 — Photomicrographs of No. 800 and No. 115K glass fibers. The No. 800 fiber (bottom) is suitable for filtering, evaporating and contact mat applications where low resistance is required. The No. 115K fiber (top) is characterized by its curly nature. This fiber provides very low density and high resiliency and offers maximum resistance to acid conditions.

and asbestos are now manufactured by combining the yarns of the desired types.

Potential processing uses include many evaporation, diffusion and fractionation applications in which the surfaces of the fibers may be wetted to increase greatly the film surface of a liquid that is to be evaporated or otherwise chemically or physically modified.

Filtering of air or gases, liquids and sludges by the straining method is cited as another potential field of use. The substantially cylindrical, smooth-surfaced fibers, Fig. 1, provide comparatively low resistance to the flow of liquids, yet the interstices between fibers may be modified to provide almost any degree of porosity by the choice of the proper fiber size and by the density at which the fibers are packed.

Still other potential processing uses are contact applications in which water is sprayed on the fibers to humidify or dehumidify air that is forced through them, and eliminator applications where the fibers are employed to gather free particles of water or other liquids entrained in the air stream.

### Properties of Fibers

The seven basic glass fibers now available are distinguished by differences in fiber diameter, tensile strength and the glass compositions employed, as shown in the accompanying table. Four glass compositions are used to provide different properties required for different applications. These properties, each of which is found in a substantial degree in all the fibers, and to a maximum degree in some, include resistance to acids, Fig. 2, and weak alkalis, to high temperatures and to severe exposure to weathering.

The four different glasses used are rarely interchangeable from one form to the other except as noted in the table of fiber properties. These different glasses are used to develop certain properties, as follows:

IN the belief that they may find new and important military uses and may assist manufacturers in the development of new post-war materials, Owens-Corning Fiberglas Corp., Toledo, has announced the availability of seven basic types of glass fibers. The fibers are offered as raw materials for use with other fibers and with plastics and cements, and for use in various types of industrial and chemical process equipment.

It is hoped that availability of the fibers will lead manufacturers to experiment with them, both to meet current urgent needs and with a view to post-war products and markets.

Fiberglas fibers are now being

used in combination with plastics where they serve as reinforcement for light-weight, high-strength structural parts for aircraft.\* The Fiberglas plastic parts can be molded at low pressures, reducing fabrication costs and manhours. Experience indicates the adaptability of the fibers to similar use as reinforcement for certain cements and plaster-like materials where their high tensile strength may give improved physical properties to the resulting product.

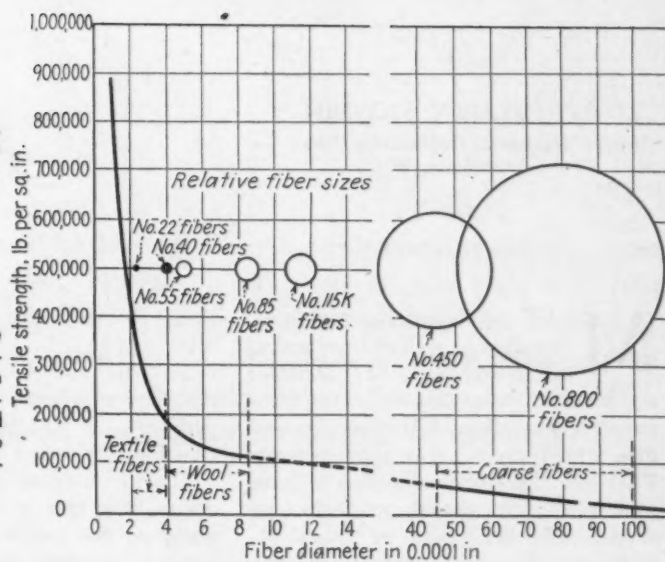
It is also believed that the high tensile strength and non-stretching and non-shrinking characteristics of Fiberglas fibers will contribute new and valuable properties to other fiber and textile materials if means can be found to combine economically the raw fibers, as in felts and papers. Fabrics combining glass with cotton, rayon

\* See "Physical Properties of Fiberglas Laminated Plastics," by Cecil W. Armstrong, Lockheed Aircraft Corp., THE IRON AGE, July 22, 1943, p. 51.



LEFT  
FIG. 2—Pad of No. 115K fibers shown enlarged in Fig. 1.

RIGHT  
FIG. 3—Tensile strength of Fiberglass basic fibers in relation to fiber diameter, adopted from studies made by Dr. F. O. Anderegg.



and which size of fiber will produce the most satisfactory results. It must be noted that fiber size and the corresponding surface area exposed to attack is an important factor in determining chemical durability under different service conditions.

Certain general characteristics can be noted, but should be used only as an approximate guide to comparative behavior. Type E glass, for example, offers the maximum resistance to weather and may be used for severe exposure to water and steam. In exposure to weak alkalis it is slightly superior to Type C glass, which offers maximum resistance to acids. Where a combination of maximum weatherability and resistance to acid is desired, Type T glass is recommended, since its weatherability is only slightly less than E glass and its resistance to acids is greater. Type F glass is for coarse fibers only and cannot be properly compared with these other types of glass.

In temperature resistance, Type E glass shows slightly superior charac-

teristics for exposures of short duration; for protracted exposures, all of the glasses are substantially alike. The service limit is approximately 1000 deg. F.

#### Strength of Fibers

The chart, Fig. 3, shows the relationship between the tensile strength of glass fibers and their diameter. The values are based on several thousand tests but must be looked upon as theoretical rather than as realized values.

Various fibers are designated by a numbering system based upon the average diameter of the fibers multiplied by 100,000. Therefore, a No. 22 fiber has an average diameter of 0.00022 in. and No. 800 fiber has an average diameter of approximately 0.0080 in. The letter preceding the number is employed to designate the particular glass composition from which the fibers are drawn. When the number is followed by a letter, the letter distinguishes between fibers of like diameter that are made by different manufacturing processes.

#### CHARACTERISTICS OF FIBERGLAS BASIC FIBERS

Fiber Number	Glass Type	Fiber Diameter		Fiber Length Average (In.)	Fiber Lubricant or Coating	Surface Area per lb. of Glass (Sq. Ft.)	Average Pack Density Lb./Cu. Ft.
		Average (In.)	Range from Average				
800	F	0.00800	±0.0005	20	None	38.7	3.5
600	F	0.00600	±0.0005	20	None	47.5	3.5
450	F	0.00450	±0.0005	20	None	68.8	3.5
115K	C	0.00115	±0.00015	6	Mineral Oil	262.0	0.5
85	E	0.00085	±0.00015	15	None	355.0	2.0
55	T	0.00055	±0.00030	8	Mineral Oil	537.0	1.5
40	E (C)†	0.00040	±0.00010	15	None	755.0	2.2
22	E	0.00022	±0.00005	16	Starch	1370.0	1.5††

†No. 40 Fiber is normally made of E Glass. It can be produced from C Glass (C40) if volume and use warrants.

††Density after de-starching or spreading and fluffing. Density before spreading bundles of fibers may range up to 70 lb. per cu. ft. or more.

By INGRAM V. STOVERN  
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# Arc Welded

MANY small factories find it impossible as well as impractical to invest heavily in specialized equipment for the making of the comparatively small quantities of jigs and dies which their needs may require. They are therefore compelled to have such work done outside of their own shops. The die costs in many instances become so prohibitive that they cannot be entirely absorbed in the production planned. Then, too,

there is the sometimes very serious matter of time to consider. This paper deals with the development and application of a low cost, thoroughly dependable die making procedure made possible by the use of arc welding.

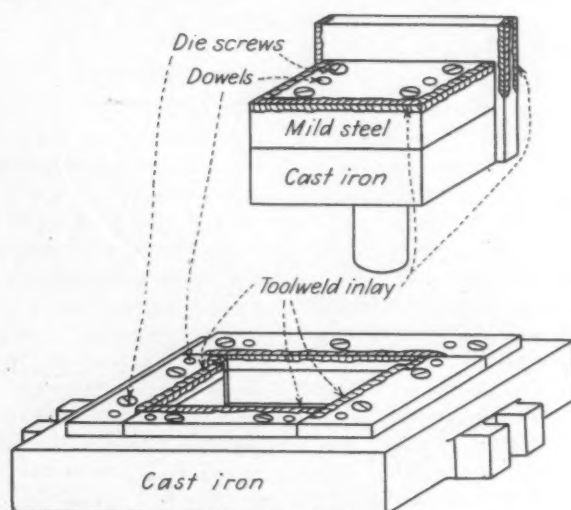
The arc welding process applied to die making is a practical solution to many of the problems and obstacles which beset the average small manufacturer. Specialized die making machine tools may be used to advantage,

but their lack does not preclude the making of excellent dies with the ordinary "garden variety" of machine tools to be found in most machine shops. A lathe, drill press, shaper, tool post grinder, small hand die grinder, and a metal cutting disk sander or belt sander are sufficient for die making if augmented by a good arc welder. A surface grinder is desirable but in its absence the tool post grinder may be mounted in a lathe or shaper and a very good job done therewith. A small bench type die filling machine may be used to advantage, although a bit of "elbow grease" applied to the operating end of an assortment of hand files doesn't do too badly either.

A 150-am. d.c. arc welder with dual continuous control has ample capacity and flexibility for practically any small sheet metal die.

The most satisfactory method of presenting the subject of welded dies is to recount the development and application of the process to the dies in the plant with which the author is connected. Originally our company lacked floor space and facilities for punch press work so all of our stampings were "farmed out" to another plant. When we moved into larger quarters, we purchased three punch presses ranging in capacity from 4 to 43 tons and took into our own plant the dies which had been used to produce the stampings for us. Originally, these dies were made to be used in floating die mounts but we wished to mount them permanently in die sets to permit easy setup and removal from the presses after our production runs were completed. These dies were not provided with holes for dowels or bolts so annealing, remachining, and rehardening would have been required to mount them in the usual manner. Since this is sometimes rather hazardous due to the tendency of tool steel to develop hardening cracks or to warp, it therefore was decided to attempt to weld them to mild steel pads and then put bolt and dowel holes through the pads to hold the elements in the die sets.

The first few dies mounted in this way were arc welded to hot rolled



ARC WELDED DIE SETS  
Arc Welded Notching Die and Punch

Cost Comparison Table

Item	Conventional Method	Welded Design
Tool steel .....	\$12.00	none
Dowels .....	1.80	\$1.80
Screws .....	1.92	1.92
Cast die set .....	5.40	5.40
Hardening .....	8.00	none
Grinding .....	6.00	6.00
Mild steel rod .....	none	1.28
Toolweld rod .....	none	2.23
Labor (@ \$1 hr.) .....	65.00	18.00
Totals .....	\$100.32	\$36.63

\$100.32  
36.63

\$63.69 saving or 64 per cent

# Die Sets

pads which had been previously machined to the correct dimensions. This machining seemed to be a waste of labor so the next die and its punch were welded to SAE 1020 cold rolled steel pads of such size as to be suitable without machining. This proved to be entirely satisfactory with just a small amount of surface grinding being done on the bottom surfaces of the pads to insure their being flat and having an even bearing on the surfaces of the die set.

During welding, the dies were prevented from overheating by the use of wet cloths applied to their major surfaces. A 1/8 in. coated rod of reversed polarity type was used with low heat, the beads being little more than tack welds. On a die element approximately 3 x 5 x 5/8 in. in size, three light beads about 1 in. long were found to have sufficient strength for the purpose and yet permitted comparatively easy removal from the pad should this ever be desired. One of the beads was placed in the center at the back of the die and the other two were placed one at each end along the front edge in such a way that about a third of each bead extended around the corner and along the side. Of course, the punch required a larger amount of welding because its smaller base area imposed greater strains upon the weld in the operation of the die.

After applying the beads, the elements were carefully quenched in water to preclude any possibility of damage to the hardened tool steel from the heat of welding. The parts were securely clamped together with C-clamps to prevent distortion during welding. About 15 dies were taken care of in this way and up to the time of this writing not a one has failed or caused any trouble whatever.

When it became necessary to make a new die for a part for an addition to our line, the die elements were still made of tool steel but their size and weight were reduced to amount calculated to accommodate safely the stresses to which they would be subjected in actual use. No margin was provided for the insertion of dowels or bolts. After hardening, they were welded to mild steel pads in the same manner as the previous dies had been.

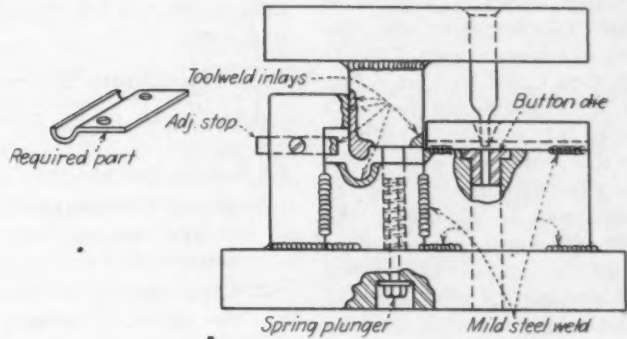
**... Small shops which lack special die making equipment can make inexpensive blanking and forming dies out of mild steel with tool steel inlays through use of the arc welding process. Savings up to 64 per cent are demonstrated. This paper was one of the entries in the 1940-42 Industrial Progress Award Program sponsored by the James F. Lincoln Arc Welding Foundation.**

The reduction of the amount of tool steel needed and the labor saved by making smaller die elements made a saving of about 30 per cent. Mounting in the die sets was simplified too since drilling, tapping, and reaming could be carried right through the die pad and its adjacent die set part.

### Hard Faced Punches

We had seen one or two crude hole punches intended for rough work of

a temporary nature that had been made of mild steel with hard cutting edges inlaid with the arc. The welding rod was a coated, self-hardening tool steel rod which deposits metal that can be used without further treatment other than grinding to desired shape and dimensions. These punches showed such remarkable strength and wearing qualities that the possibilities of this application of the arc merited further investigation



### ARC WELDED PROGRESSIVE DIE WITH TOOL STEEL INLAYS

Cost Comparison Table

Item	Conventional Method	Welded Design
Tool steel .....	\$2.75	none
Mild steel .....	.50	\$1.30
Dowels and screws .....	1.05	none
Button dies .....	none	3.00
Hardening .....	2.00	none
Toolweld rod .....	none	.78
Labor .....	45.00	15.00
Totals .....	\$51.30	\$20.08

\$51.30  
20.08

\$31.22 or 59 per cent saving

and experimentation. Accordingly, three hole punches were made of mild steel, with diameters of 23/32, 29/32 and 13/64 in. The cutting edges were rabbeted out to about 1/8 in. square cross-section and inlaid with self-hardening tool steel rod. They were then carefully ground to their finished dimensions and clearances with no heat treating of any sort. They were welded to cold rolled steel pads with mild steel rods, the pads were ground flat on the bottom and the elements were mounted in permanent die sets. These punches have been in service for over a year. One of them has punched upwards of 200,000 holes in 22-gage cold rolled steel and still shows no appreciable signs of needing sharpening or other attention. The savings were far greater in this case because no tool steel other than the welding rod was used in their construction. Heat treating was entirely eliminated and labor cost was lower because of the greater ease and rapidity of machining mild steel instead of tool steel.

If desired, such things as intricate small punches may be made of tool steel in the usual way and sent out to specialists for heat treating previous to welding. But the exercise of a little ingenuity makes it possible to build up such punches of several mild steel pieces which have been fitted to each other, then inlaid with hard facing metal and ground before being finally welded into a composite whole.

The results obtained with these simple hole punches indicated that the process could well be applied to the construction of more complex dies. Consequently, the next die to be made was more elaborate but still embodied all the desirable features of the punches. It too proved to be entirely satisfactory. Since results were so gratifying from the substitution of mild steel and the arc welder for tool steel and heat treating, attention was turned to other possible means of reducing costs. Cold rolled steel of SAE 1020 sulphur-free analysis is quite satisfactory for welding purposes and enjoys a decided advantage in that it may be easily and cheaply obtained in a wide variety of shapes and sizes. As a result considerably less machining is necessary than is the case when hot rolled steel is used. It is also possible to make up intricate and complex die sections by merely fitting a number of pieces together. The cutting edges should be hard faced and ground completely before welding the several pieces together to make up the desired punch or die. One distinct advantage is that alterations and repairs are easily made. On ordinary

run-of-the-mill work the disk or belt sander referred to earlier should prove entirely suitable.

Should small hole punches be required, they may be of the interchangeable, replaceable type sometimes known as button dies and stocked in a large assortment of sizes by some die supply houses. It would be foolish indeed to use a large block of tool steel with its attendant disadvantages merely because one or more small holes are needed in the part the die was designed to produce. Fixed strippers or stops and guides may also be made up of several pieces welded together and then lightly welded to the die element. They are easily removed from the die element for die sharpening or other reasons and will never cause trouble by shifting out of their proper position.

This discussion has dealt chiefly thus far with dies of the blanking and cutting type. The same principles may be just as advantageously applied to the making of forming and drawing dies. Cost savings should be even greater due to the larger amount of material and labor which these dies often require. Locating stops or guides or any other attachments may be welded onto the elements in the same manner as for blanking and cutting dies.

#### Advantages Summarized

Advantages to be gained by the employment of the arc welder as a die making tool are the following:

1. Heavy investment in specialized or precision machine tools is unnecessary.
2. Great savings in time possible by the use of arc welding instead of conventional methods.
3. Alterations can be easily, quickly and cheaply made. This also applies to repairs.
4. Heat treating is entirely done away with, thus saving additional time and expense.
5. An inventory of expensive and hard-to-get tool steel is eliminated.
6. Much tedious and wasteful labor on the part of the diemaker is eliminated, thereby releasing him for other important work and greatly increasing his efficiency and output.

The average diemaker, good machinist or highly skilled mechanic already possesses many of the qualifications of a good arc welder operator. He usually has a steady hand, excellent muscular coordination, and considerable technical knowledge of many

of the factors involved. If such a man is taught the fundamentals of arc welding theory and practice and is then permitted to experiment for himself, the arc welder becomes as useful, convenient and versatile a tool in his hands as any other with which he may be familiar. If he is trained to do his own welding on die work, the results should be even better than if the work were turned over to a regular arc welder operator. Then, too, he has a clearer understanding of the desired results. He does not have to waste valuable time trying to explain to another man just what he wants done and how. He is also much more likely to employ arc welding to its fullest extent if he does not have to trouble another man to do the actual welding for him.

#### Recommended Procedure

Here are a few recommendations in procedure which the author would like to make:

1. Be sure that the base steels employed are of a suitable analysis for welding. Sources of supply will gladly furnish any information necessary in this respect.
2. Avoid excessive heat, particularly in the vicinity of thin sections or completed inlays or overlays. Careful and thorough packing with wet cloths and frequent but cautious quenching in water will greatly minimize ill effects due to undesirable heat.
3. Clamp all parts to be welded in such a manner that all welding and cooling may be accomplished without the removal of the clamps until such welding and cooling have been completed.
4. An inlaid cutting edge approximately 1/8 in. square in cross-section is ample for cutting up to 16-gage cold rolled sheet steel. A 3/16 in. square cross-section will do for thickness up to and including 13 gage. On forming and drawing dies an overlay of 1/8 in. thickness will be suitable for steel of 13 gage.
5. Be sure that each bead is thoroughly cleaned and permitted to cool before the succeeding bead is applied. Three or four small beads will have far better grain characteristics and considerably less admixture of base metal than one large bead.
6. Preheating to about 500 deg. F. has been found to greatly reduce the likelihood of pin holes

or cooling checks. However, minor imperfections in the deposit need cause no serious concern because they will not spread through the remainder of the piece as they would be the result in hardened tool steel.

7. In grinding, treat the inlaid or overlaid sections in the same manner as if they were composed of high speed steel.

The accompanying drawings are self-explanatory and should clear up any details about which the reader may be in doubt. They embody an unorthodox method of die making which, in spite of its radical departure from old fashioned methods, has nevertheless proved to be wholly dependable, if a year and a half of actual development and severe use is acceptable as proof. Cost comparison

tables have also been carefully compiled on the basis of actual cost records and estimates. These drawings and cost comparisons speak more eloquently than volumes of written matter. After examining them, the only conclusion that can be made is that the arc welder as a diemaker's tool is not only extremely practical, but has unlimited possibilities for further development and exploitation.

## Sealing Tube Ends With Plastic

**A**NOTHER contribution to solving the problem of obtaining strategic materials for aircraft manufacture has been chalked up by engineers of Consolidated Vultee Aircraft Corp. through the application of a new thermo plastic dipping process for tube sealing and surface protection for work in process. This Plastalloy\* process was developed by the industrial engineering and process and material groups at Vultee Field Division.

As a direct result of the development, the use of cellulose caps and other methods of masking for temporary tube sealing have been done away with resulting in drastic reductions in labor and material costs since the plastic seals are quickly and easily in-

stalled and removed. The thermoplastic material may be reclaimed and used indefinitely.

To seal tubes using Plastalloy, the ends of the tube are dipped into the melted plastic  $\frac{1}{4}$  in., the material then adhering to the tube, covering the opening with a tough, durable film. Almost any type end may be sealed in this fashion, and it has proven tenacious enough to withstand rough handling, although being easily removed by lifting with a finger nail. Once the seal is broken it cannot be replaced, for surface adhesion is only obtained when the plastic is hot.

The only equipment necessary to seal tubes with Plastalloy is a heater pot, an electrically heated pot with either a manual or thermostatic heat control being ideal for the purpose. A temperature range of 145 to 150 deg. C. is recommended to obtain seals of desired thickness and adhesive qualities. The pot should have a volume of 2 qt. or more to prevent undue temperature fluctuations, with resulting poor seals.

There are other applications for Plastalloy, too. It may be used for protection of finished surfaces or delicate threads, which may be dipped in the same manner as tubing. The slight cost of protection in this manner is far less than most minor rework costs resulting from damage in handling.

Small bearings and bushings are sometimes lost from assemblies if not individually anchored into position, but by dipping these items in Plastalloy such parts cannot be lost and the operation is faster than tying or other commonly used methods.

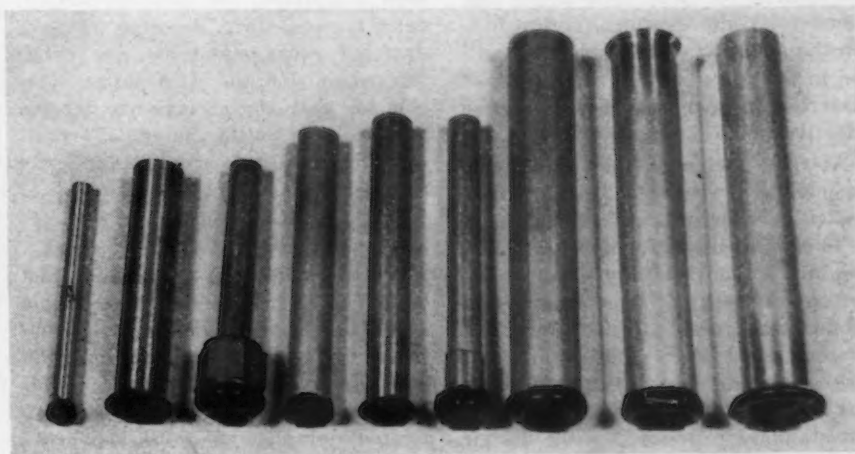
Tubing seals have been estimated to cost approximately one mill per end installed. This cost is figured on the basis of dipping 20 ends per min., which is easily possible, and using 50 per cent reclaimed material. This figure applies to average sized tubes. Where larger sizes or extreme lengths are encountered, the cost would be slightly more.

\*Plastalloy is a product of the Plastalloy Co., Burbank, Cal.

**D**IPPING tubing ends into an electrically heated pot containing Plastalloy is demonstrated by an employee of Convair's Vultee Field plant.



**P**LASTALLOY may be used as a protective surface covering as well as a seal for tube ends, as this Convair picture demonstrates. The material adheres to the surface as a tough, durable film. It may be removed by lifting with a finger nail, and may be reclaimed for further use.



# Gear Makers Adopt New Standards

**... Work of various technical standards committees of the American Gear Manufacturers bear fruit in the form of new gear standards and practices adopted at the 26th semi-annual meeting of the association held in Chicago last week. New program of hob standardization under way.**

WHILE only three formal technical papers were presented at the 26th semi-annual meeting of the American Gear Manufacturers Association, as in former meetings the largest amount of time was devoted to technical and commercial committee meetings. As a result of these group sessions, the convention held Oct. 25-27 at the Edgewater Beach Hotel, Chicago, which incidentally drew the largest attendance in the history of the association, was able to adopt a number of new AGMA standards and practices, to report progress on others and to initiate a new program which will ultimately result in the standardization of hobs. Further, it was recommended to the program committee that a full day be devoted to committee sessions at future conventions. As it was, some committees labored far into the night to reconcile technical view points and commercial interests in order to hasten the adoption of standards that will aid in the more efficient utilization of materials in gear sets and their more effective performance.

At the meeting, the association adopted a new AGMA standard for fine pitch spur gears. It is based on a 20-deg. involute form, which incidentally is likely to become the standard pressure angle for larger size commercial gears, according to the present trend of committee thinking. The same fine pitch gear committee has set itself the program of working out standard practices for the design

of straight bevel and spiral bevel pinions, tolerances of fine pitch gears and inspection procedure.

At the request of the American Petroleum Institute, revisions were adopted on standards for durability ratings on large diameter pinions and for gears heat treated after cutting, as used in oil field applications. Data on the design of high speed helical and herringbone gearing was brought up to date and was adopted as a tentative AGMA practice. An AGMA standard for cast iron gear blanks was also adopted, as well as a mill gear standard practice, a standard practice for rating spur gears and for lubrication of mill gears. A standard on gear inspection practice, worked out in cooperation with the American Society of Mechanical Engineers and now being processed by the American Standards Association, was approved as an AGMA standard at this meeting. In line with a project begun a year ago, all previously adopted standard practices are being re-edited in conformance with a uniform system of nomenclature and cross references. Much of this work has already been completed. In this connection, gear nomenclature is being revised, drafting room standards are being worked on and the ASA letter symbols for gear engineering are out for approval by letter ballot. Terminology on gear wear and failure was adopted at this Chicago meeting.

## Contract Termination

As in the case of the machine tool builders (THE IRON AGE, Oct. 14, p. 125), contract termination is a problem worrying the gear manufacturers. In summarizing the situation, A. J. Jennings, Cleveland Worm Gear Co., pointed out that up until the pres-

ent about 8250 contracts had been terminated, having an initial valuation of \$5.8 billion, representing \$2 billion more than all the contracts terminated at the close of World War I. He called attention to two new bills on which hearings are now being held, one sponsored by A. J. May, chairman of the House Military Affairs Committee, the other by Sen. James E. Murray. Urging that the association go on record favoring the mandatory cash settlement, upon termination, of 75 per cent of the original contract value as provided in the Murray Bill, Mr. Jennings also suggested the group back the proposal originally made by Clarence Collins, president, Reliance Electric & Engineering Co., Cleveland, which embodies the 75 per cent clause as well as the following:

(1) Settlement of overall claims by companies or plants instead of by individual contracts. This change in present administration of the law would simplify checking of inventory and application of overhead distribution and would tend to reduce paper work considerably.

(2) Provision that inventories, if not cleared in 30 days after termination of contract, be turned over to a separate government agency to be created for the purpose, with the provision that storage be at the expense of that agency. The present system of estimating the salvage value of all inventory, which is to be credited to the government, is a very lengthy process and tends to hold up settlement of claims.

(3) Substitution of a single contract termination board, preferably headed by a civilian, in place of the separate boards representing the various service branches. This should eliminate much duplication of effort and the necessity of separate audits by each branch.

In the latter connection, Mr. Jennings estimated that the \$125 billion in war contracts outstanding are roughly divided as follows: War Department, 60 per cent; Navy Department, 30 per cent; Maritime Commission, 5 per cent; Treasury Department, 2½ per cent, and foreign (Lend-Lease) 2½ per cent.

In the discussion, it was brought out that contract termination as presently handled is a slow process and at the present rate would take about 25 years to terminate the 250,000 contracts outstanding. One member of the association reported lack of settlement on a Navy contract termi-

nated 1½ years ago. It was generally agreed that cost accounting systems should be so set up that figures for government audit could be produced on short notice. The big gear producers have assigned special accountants to this line of work.

### WPB Forms Being Simplified

A trend toward further simplification of WPB reporting forms was indicated by R. C. Solenberger, general industrial equipment division of WPB, who said that efforts are being made to reduce needless paper work as much as possible. All frequently used forms will be processed by WPB field offices. By raising the top limits on orders that local offices can process, decentralization will be achieved and the need for trips to Washington will be less frequent. Within 90 days, the "ante" on PD1A forms will be raised from \$1000 to \$2500. PD133 forms covering orders up to \$2500 can also be processed locally before long, Mr. Solenberger said.

Another boon to the small producer is to permit yearly rather than quarterly CMP requirements to be processed where the lots are small. The limit on carbon steel, for instance, will be 150 tons per quarter and on alloy steel, 50 tons per quarter. Companies making less than \$15,000 worth of gears annually need fill out no forms hereafter. Form PD843 has been reduced from three pages to one and further simplification has been achieved by combining speed reducers with unmounted gears.

Mr. Solenberger called attention to a number of revisions made on Sept. 24 to Order M293. Although the revisions still leave some things to be desired, the revised order does accomplish the purpose of serving to identify orders as to end use, to simplify scheduling and to freeze order boards on critical items. A "Z" product class has been added, applying to certain critical components entering into the manufacture of naval vessels, aircraft, detecting apparatus and combat tanks. In summing up, the speaker stated that he did not believe the gear industry will have further restrictions placed upon it, inasmuch as the industry is fully capable of specifying its own materials. Procedures will be simplified still further and orders will be changed to suit changing conditions. An attempt will be made to "unscramble the eggs," he concluded.

### Manpower Problems

Citing the example of what help his department was able to bring to the critical bearing industry, Philip



RUSSELL C. BALL

President of the American Gear Manufacturers Association and president of the Philadelphia Gear Works, who presided at the semi-annual meeting of the association, Oct. 25-27.

R. Chase, WPB office of manpower requirements, led his audience to believe that occupational deferment could be obtained for non-replaceable men in the gear industry, of which he said too few people in Washington knew the importance in the war effort. With the cooperation of the Army and Navy, his group is getting 2000 men for a Philadelphia bearing manufacturer inside of 30 days and output is expected to rise 10 per cent as a result.

Criticizing the lack of initiative on the part of the average employment manager (often "too small a caliber man for the job"), Mr. Chase admitted that even his department had to "do handsprings" to ferret out new sources of labor supply. The real difficulty is in holding workers in the plants. In one plant he analyzed, only 5 per cent of the skilled workers were lost to Selective Service! The rest were lost through "normal" turnover. Use of exit interviews, Mr. Chase said, reduced the number of "quits" by 30 per cent in one plant. Transportation is often a real difficulty, and it is sometimes necessary to get special help to obtain additional gasoline in order to keep workers on the job. As to draft age men, Mr. Chase said it is possible to obtain an indefinite deferment for all those in critical occupations, according to Memorandum No. 115B sent to all local Selective Service Boards on Sept. 1. It is

even possible to get a skilled man back from the Armed Services, if a replacement cannot be found. He urged manufacturers to submit complete job descriptions on Form 42A on which job deferment is requested.

At an earlier session, John H. Jackson, Jackson Gear Works, told how his company had worked out a systematic release schedule as required by the manning tables. In a jobbing gear shop, he said, some men are absolutely irreplaceable and in all classes of work a longer training period is required than in a high production shop. Mr. Jackson thought it unthinkable that pre-Pearl Harbor fathers should be drafted. "We can't make gears for the war effort without them," he concluded.

### Good Worker Relations Urged

On the same panel on industrial relations and manpower, Louis R. Botsai, vice-president of the AGMA and manager of the Gearing Division of Westinghouse, agreed that one of the principal problems was to hold what workers a company has. The Army and Navy are competing for the same kind of labor as industry is and the latter is going to lose them, he predicted. Production has reached its peak and we will coast from here on, but the real fighting is just beginning, Mr. Botsai said. Managers must therefore do a better job of getting more out of what they have. There must be increased utilization of manpower and the speaker foresaw an increased use of incentive systems, with labor and government approval. High labor turnover will be looked upon with suspicion and ineffectual management will have to be replaced, as it already has been in some notable instances. The answer to high turnover is good industrial relations, according to Mr. Botsai. He urged management to be more friendly with its men but not to forget that contented workers seek job security, steady work, good pay and opportunity for advancement, both now and in the post war period. Better training programs are required, particularly of foremen.

In this last named connection, S. M. Brooks, Tool Steel & Pinion Co., Cincinnati, praised the job instructor program worked out by the Training Within Industry group of WPB. This 10-hr. course is primarily intended to make effective instructors out of foremen and other supervisors. Job methods training is a second phase, not so widely used but one with which "perfectly amazing records have been made." It involves an analytical approach to job sequences, with the idea

of combining operations and otherwise simplifying the job. Job relation training is the third program, primarily intended to get foremen to think about the principles of good industrial relations in their daily contact with workers.

Mandatory job freezing is not the answer to reduction in turnover, according to D. W. Diefendorf, Diefendorf Gear Corp., Syracuse, where such a plan has been tried out locally. Labor hoarding is another factor and is particularly prevalent on the part of cost-plus contractors. Despite censure of the local manufacturers associations and federal regulations, such concerns continue to run large display advertisements in the classified sections of Syracuse newspapers.

Absenteeism also came in for some comment. Howard Dingle, president, Cleveland Worm Gear Co., said it was particularly prevalent among women employees. The best way to lower absenteeism is to check up at the home of the worker one day after sickness is reported.

### Gearmotor Standards

In a paper prepared by C. B. Connell, Westinghouse Electric & Mfg. Co., and read in his absence by F. Richardz of Westinghouse Gearing Division, industry was urged to make use of gearmotors designed and rated in compliance with AGMA standards. It was generally conceded by members of the association that the culmination of the work of the AGMA speed reducer and gearmotor committee represents one of the broadest and

most important programs in the power transmission field. In the early days of this committee's formation few members saw eye to eye as no two manufacturers of gearmotors offered the same comparable product, ratings were at variance and there was lack of agreement on applications. The present set of standards has brought order out of chaos.

The newly adopted gearmotor standard practice embodies standardization of output speeds, said by some to be the most important step in the whole program, and has classified applications by types of duty. Limitations are put on design stresses of shafts and bolts, and on strength and durability of gears. Tooth form, finish, allowable spacing and lead errors, and relative hardness between gears and pinions are also controlled. Gearmotors rated in accordance with this standard practice will be identified by the AGMA monogram on the nameplate of the manufacturer.

This gearmotor practice divides the main application group into three classes, as follows:

Class I—For steady loads not exceeding normal rating of motor and 8 hr. a day service. Moderate shock loads where service is intermittent.

Class II—For steady loads not exceeding normal rating of motor and 24 hr. a day. Moderate shock loads for 8 hr. a day.

Class III—Moderate shock loads for 24 hr. a day. Heavy shock loads for 8 hr. a day.

A table of typical applications has been prepared indicating the normal types of service encountered. Standard Gearmotor output speeds are shown below:

R.P.M.	R.P.M.
1430	68
1170	56
950	45
780	37
640	30
520	25
420	20
350	16.5
280	13.5
230	11.0
190	9.0
155	7.5
125	6.0
100	5.0
84	4.0

The gearmotor standard makes use of a basic standard practice for computing the strength and durability of

helical and spur gearing as used in concentric and parallel shaft gearmotors. The formulas are far more complex than the original Lewis formula but the calculations have been simplified by the use of graphical data, particularly in the durability formula. Calculations for shaft stresses take into consideration an accepted maximum value for stress concentration effects for bending and torsion due to fillets, keyways, etc., and in certain instances stresses are computed by the maximum shear theory.

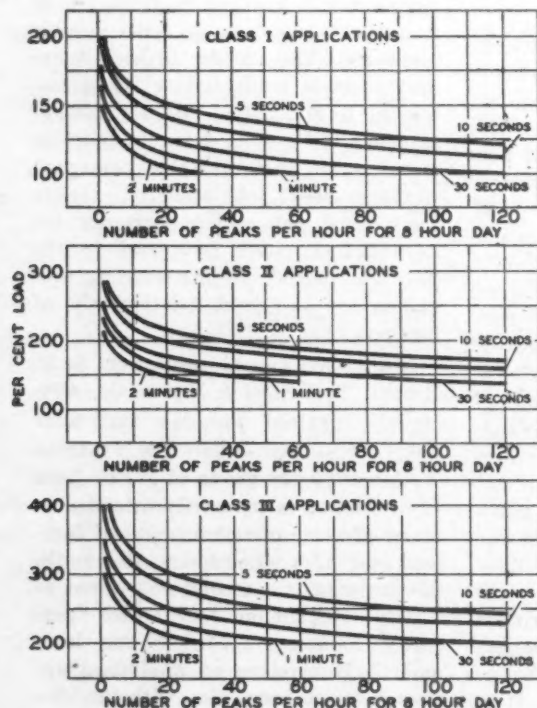
### Overhung Load Factors

Allowable overhung loads are based on the weakest of shafts, bearings and bolting, using stress limits set forth in the standard. Extraneous shaft loads calculated by torque requirements must be multiplied by the following factors in order to obtain the effective total pull: Chain, 1; pinion,  $1\frac{1}{4}$ ; V-belt,  $1\frac{1}{2}$ , and flat belt,  $2\frac{1}{2}$ . Gearmotor manufacturers hereafter will specify the allowable overhung load capacity of each respective rating; where the overhung loads exceed such values, the unit may be altered or the gearmotor selected to suit the overhung load conditions rather than the horsepower and speed rating.

In order to assist the purchaser and the manufacturer in determining the proper class of gearmotor, the chart illustrated has been prepared. These curves indicate the number of peak loads of a certain intensity and duration that are allowable per hour for an 8 hr. day. In order to correctly apply these curves, it is necessary to determine the duty cycle of the application. The duty cycle should indicate the highest torque value, its duration and frequency, that the gear will be required to transmit. Where the peak torques are outside the curves shown, the gearmotor should be selected on the basis of the peak torques being the normal rating. Such units would bear a special classification on the AGMA nameplate.

### Standardization of Hobs

A long term program aimed ultimately at hob standardization was launched by the presentation of a paper on the factors influencing hob standardization, prepared by George P. Maurer of the Falk Corp. He pointed out that tool company's standard or catalog hobs were mainly developed to suit the production of automotive and tractor gears, and while such hobs have been used successfully for cutting other types of gears, they do not completely serve the requirements of the industrial



ALLOWABLE peak loading of gearmotors for peaks of indicated durations for three classes of applications.

gear industry. As a result many special types of hobs have been made and Mr. Maurer illustrated the wide variations now found in even catalog hobs for cutting the same size and type of gears. Lack of standardization obviously affects interchangeability, delivery schedules, cost, economical use of hobs and cutting efficiency, he indicated.

The speaker also pointed out that the tolerances for precision as specified in hob catalogs are based primarily on requirements of automotive gears and the hob manufacturer's production facilities. There has been little progress made by such manufacturers in establishing hob tolerances based on AGMA gear inspection tolerances and for this reason the production of gears to acceptable standardized limits is still in its infancy, Mr. Maurer added. In many instances it has been found necessary to hold one or more elements of hobs to closer tolerances than specified for Class A tolerances in order to obtain the desired precision in industrial gears and marine gears. Mr. Maurer maintained that hob standardization should include the coordination of hob tolerances with gear tolerances.

Overall dimensions of hobs very considerably today, partly because of variations in hobbing machines, such

as arbor diameters and the limiting dimensions of hobbing slides, coupled with individual ideas of how many axial cutting positions should be provided. Then, too, hob lengths standardized principally on automotive requirements are not adequate for large gears produced for marine, well drive and commercial use. For this reason a new set of standards for such hobs is necessary, Mr. Maurer stated.

#### Factors Involved

Considerable attention will also have to be given to the number of gashes on hobs of various diameters and the diameters of the hobs themselves. For any given pitch, the hob diameter depends upon the capacity of the hobbing machine and the gap required in double helical (herringbone) gears. To obtain the maximum efficiency of any hob, its diameter should be made as large as these limitations permit, Mr. Maurer declared. Similarly, hob bores should be determined from established arbor sizes and the hob diameters for each pitch. Tooth form is another consideration and will have to be tied in with the standard tooth forms now being worked up by another committee of the AGMA. Those in the audience agreed that such hob standardization is essential and the wholehearted co-

operation of both hob producers and gear manufacturers was pledged.

In an extremely long and technical paper, D. W. Dudley and H. Poritsky of General Electric Co. showed how the form of a disk type milling cutter or of a hob could be determined mathematically for cutting worm gears of any given tooth form in either the axial or the normal plane. They used a kinetic theory in which velocity and time elements of the rotating cutter were involved. In the discussion of this paper, Allan H. Candee, Gleason Works, showed how the same results could be obtained more readily and more accurately by a geometric analysis of the same problem. In this connection, it was brought out that a number of years ago Mr. Candee had patented a multi-thread hob with involute form in the transverse plane based on such an analysis. Such involute helicoidal hobs are being used today for cutting double helical gears at very high speeds. One company is using multi-thread hobs of this form for both finishing and roughing work, despite the difficulties of producing such hobs to the degree of accuracy required for large marine propulsion gears. Elsewhere, multi-thread hobs are used only for roughing work, because of the limitations on accuracy of the hob.

## Precision Gear Grinding

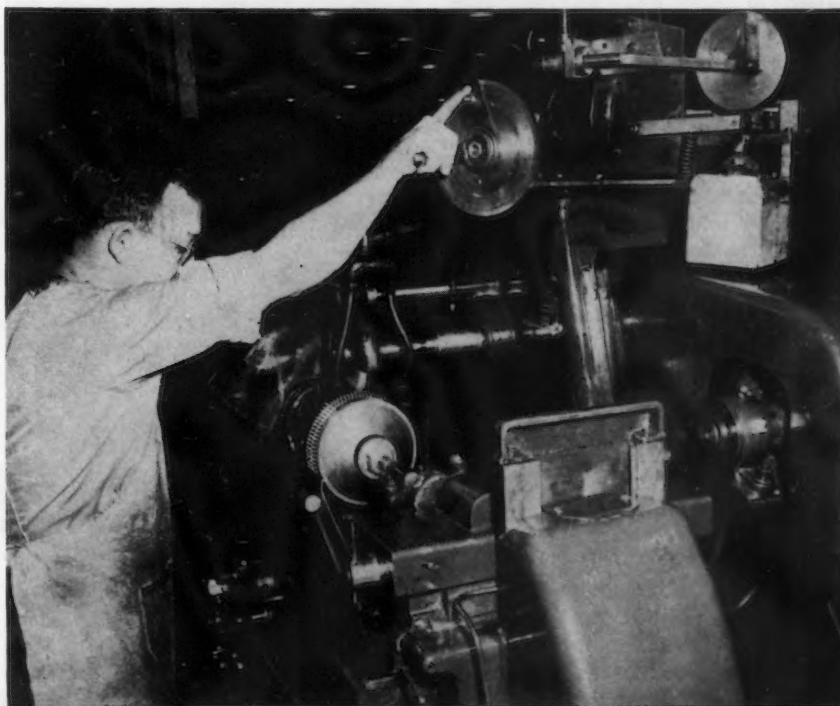
FOR gear tooth grinding operations where the depth of cut desired is greater than can be taken with a single adjustment of the cutting feed, an automatic adjustment has been developed at the Lycoming division of the Aviation Corp., which micromatically advances the feed after each complete cycle of the gear.

As shown in the accompanying illustration, a ratchet is mounted on the worm gear feed control of a standard gear grinder. A dog on the end of an eccentrically mounted push rod actuates the ratchet, when a micro-limit switch is tripped by a pin on the indexplate. The switch operates a solenoid, which engages the clutch between the eccentrically mounted push rod and a continuously operating 1/6 hp. motor.

A sleeve-and-thread adjustment on the push rod permits setting it with sufficient accuracy to advance the cutting feed in the degree desired.

This automatic arrangement eliminates need for manual advancement of the cutting feed and makes it possi-

ble for one operator to keep three gear grinders in operation simultaneously.

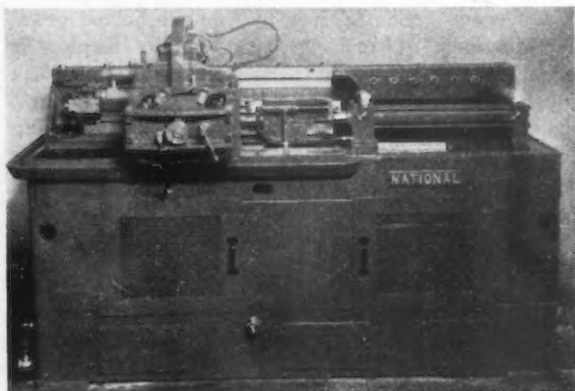


# New Equipment . . .

## Machine Tools

New designs and improvements in tool room and production equipment are described in this second section devoted to machine tools.

**A** THREAD roller for rolling threads on alloy steel bolts having tolerances within those of Class 3 or 4 fits has been introduced by the *National Electric Welding Machines Co.*, Bay City, Mich. A complete hy-



draulic system actuates all moving members. The reciprocating ram, to which the moving die is attached, is operated by a direct connected, hydraulic cylinder which insures smooth transverse operation. The hydraulic drive, with its variable speed control, allows proper speeds to be selected to suit the steel being rolled. The thread rolling die is attached to a saddle block, which in turn is mounted on three adjusting wedges. By having a compound screw adjustment on these taper wedges, micrometer movement of the wedges is obtained and the die tilted to correctly align the die face of the moving die with that of the stationary die. A pump provides a flushing oil flood to the faces of the dies, while in operation. After the part has been rolled, it drops into a leather-lined chute and then rolls into an oil bath. On high production parts, a hopper feed can be applied.

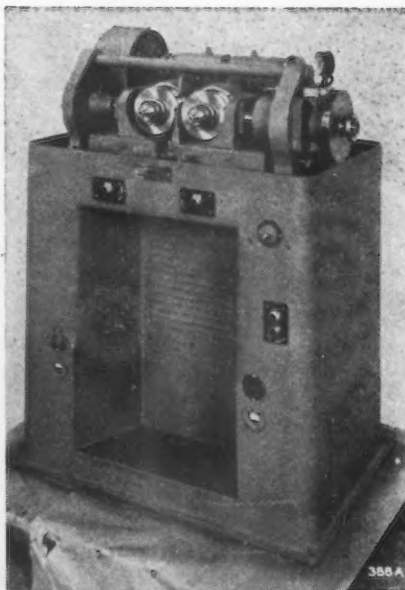
### Thread Rolling Machine

**T**HE Watson-Flagg Machine Co., Inc., Paterson, N. J., is building a precision thread rolling machine which rolls outside threads by the cold forming process, using two steel rolls

of large diameter that have on their faces negative multiple threads of the same profile, pitch and helix angle as the thread to be rolled. These thread forming rolls are pressed with gradually increasing hydraulic pressure

into the workpiece or blank that has been machined to pitch diameter, and all threads are rolled simultaneously. The blank, resting on a blade between the rotating rolls, turns on its axis but does not move axially. The automatic sizing control releases the hydraulic pressure on the rolls when the required thread pitch

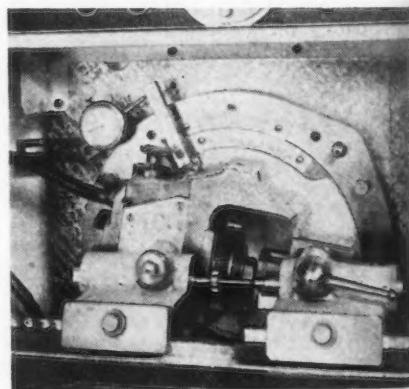
diameter is reached, and then automatically returns the carriage-mounted roll to its starting position. Threads can be rolled to the accuracy required for a Class 4 fit. Capacity is  $\frac{1}{8}$  to 1 in. for high tensile steels and up to  $4\frac{1}{2}$  in. for lower strength materials. Length of thread is up to



2 $\frac{1}{4}$  in. Because all threads, regardless of length, are rolled simultaneously, output is high. The machine is being sold by *W. A. Schuyler*, 250 West 57th Street, New York.

### Small Gear Shaving Machine

**T**HE Fellows Gear Shaper Co., Springfield, Vt., has placed on the market the No. 4 gear shaving machine, which will handle gears up to 4 in. pitch diameter and 20 diametral pitch and finer. The work is held on fixed centers located in adjustable head and tail stocks, and the work slide, instead of the shaving



tool, is reciprocated by a unique type of crank mechanism. The head is adjustable for crossed-axes setting, having a maximum angular movement of 20 deg. both sides of center. A scale for degrees, a vernier for minutes and a dial indicator for finer settings is provided. The tool spindle is driven by a separate motor mounted on the feed slide. The motor which drives the work slide also operates the compound pump, and is provided with a plugging switch to prevent coasting of the slide.

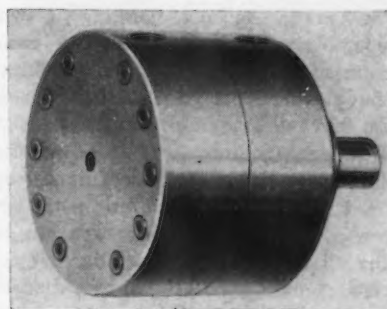
### Formed Wheel Groove Grinder

**T**HE Geargrind machine illustrated was designed by the *Gear Grinding Machine Co.*, 3901 Christopher, Detroit, for grinding the ball grooves in the outer housing of the Rzeppa constant velocity uni-



### Nut Tapping Machine

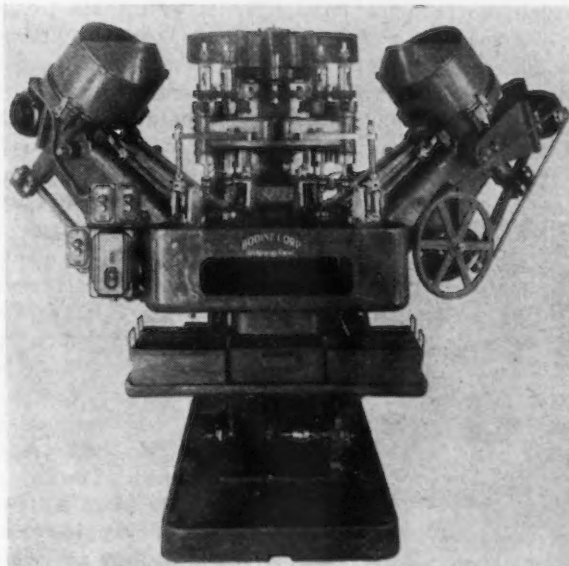
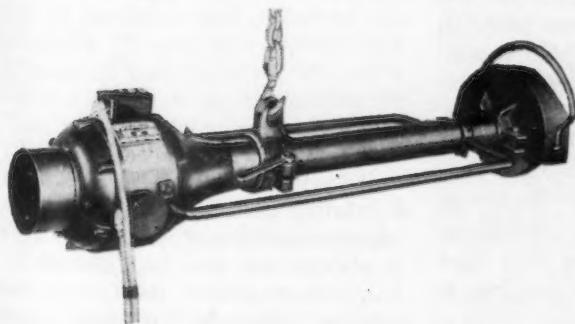
**THE** Bodine Corp., 317 Mountain Grove Street, Bridgeport, Conn., has perfected a fully automatic nut tapping machine which delivers four nuts simultaneously to four tapping stations by means of two hopper feeding mechanisms, each equipped with two adjustable chutes. Four nuts are produced per stroke, each nut being discharged to its individual collecting box so that the product of each tapping spindle may be individually gaged prior to its delivery to stock. Two sizes of nuts may be run simultaneously. Each spindle carries its own compensator which allows the tap to follow its own lead. Spindle drive is through a positively geared and timed train of gears. There are two sizes of standard machines, one handling nuts up to and including  $\frac{1}{4}$  in.-28th and the other  $\frac{1}{2}$  in.-20th.



versal joint. The work oscillates on a swinging head, controlled by an automatic magnetic brake, permitting the formed wheel to grind the radii for the ball groove in a curve. The formed grinding wheel is fed in from the front, the rapid traverse of the table being governed by means of an air cylinder. Ball grooves in the various sizes of Rzeppa joints range from 11/16 to 1-13/16 in.

### "In-between" Grinder

**THE** Marschke "In-between" grinder introduced by Vonnegut Moulder Corp., 1815 Madison Avenue, Indianapolis 2, fits between the small flexible shaft machines and large swing frame grinders. The direct motor drive, ball bearing construction lets the wheel get full use of the 3 hp., 1800 r.p.m. motor. Placement of handles, on each side and above guard, permits two-handed pressure to get maximum cutting from 12 x 2 in. wheel. The combination of balance, swivel collar suspension and light weight permits angling the machine to any desired position to apply the wheel to every exposed surface on all sizes and shapes of castings. Polishing wheels and buffs may also be employed.



### Constant-Delivery Pumps

**A** NEW line of constant delivery, hydraulic (oil) vane type pumps designed especially for high pressure operation with high operating efficiencies are announced by *Hydra-Motive Division*, 723 East Milwaukee Avenue, Detroit. Available in three sizes to give from  $2\frac{1}{2}$  to 60 g.p.m., the pumps have maximum continuous operating pressure of 1250 lb. per sq. in., but pressures as high as 2000 lb. per sq. in. can be handled for prolonged periods. The patented feature of dual vanes counter-

balances the total outward pressure on the vanes and prevents overheating and wear. Two vanes are used in each slot, ground with a bevel so that oil under pressure can reach the outward edge of each pair of vanes. By changing the angle at which the vanes are ground, they are held against the stator with only the necessary amount of pressure to effect an adequate seal. Compound pumping, which increases the volume of delivery as much as 30 per cent, consists essentially of employing the ends of the vanes nearest the shaft to function as a piston-type pump. On the intake cycle, they pick up oil from an intake port and trap it in the vane slot. On pressure portion of the cycle, when the vanes are forced back toward the shaft, the oil is forced out of the slot into an outlet port. This sequence occurs twice during each revolution of the rotor and at diametrically opposite sides so that the hydraulic forces are entirely balanced.

### Metal Saw

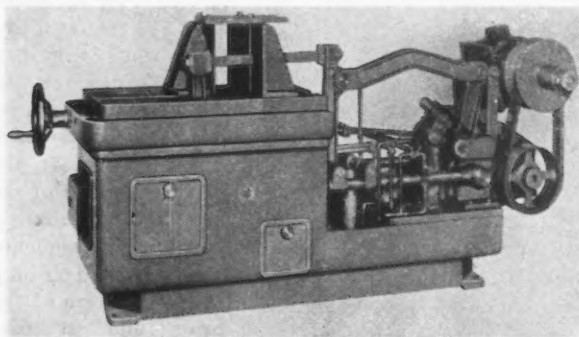
**THE** Johnson Mfg. Corp., Albion, Mich., has put on the market a metal saw for wet or dry cutting.



The pump is non-clogging piston type, driven by a noiseless cam, mounted in frame of the machine. The power is taken from the present drive gear, eliminating necessity of separate motor. The speed of the pump is automatically regulated by the speed of the machine, with the flow of coolant in direct relation to blade speed. If dry cutting is desired, pump can be readily disconnected. The saws are available with or without coolant attachment.

#### Hack Saw

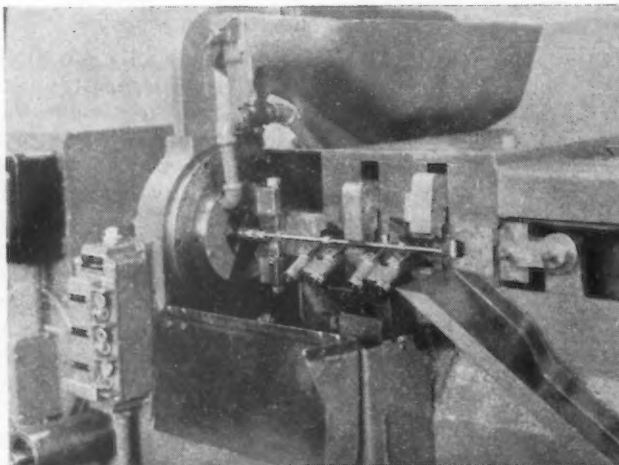
**T**HE main saw frame of the hack saw developed by the *Foley Mfg. Co.*, 11 Main Street, N. E., Minneapolis, is below the table, which permits placing work on table with overhead crane. For this purpose the blade is quickly removed from frame by loosening one nut, leaving an unobstructed flat plane surface on cutting table. The stroke is automatically adjusted from 6 to 12 in. to fit size of work by patented link action, which is controlled by the spread of vise jaws. Variable blade stroke of 60, 80 and 120 per min. assures constant cutting speed. Adjustment of vise for large or small work auto-



matically varies r.p.m. of machine. The vise jaws are 10 in. high. The length of the blade is 18 in. and the saw guides are 12 in. apart.

#### Nut Tapping Machine

**I**NCREASED production, simplified construction and greater versatility are claimed for the improved line of straight shank nut tapping machines made by the *Waterbury Farrel Foundry & Machine Co.*, Waterbury, Conn. Three standard sizes cover a range in capacity from  $\frac{1}{4}$  to  $\frac{3}{8}$  in. tap diameter. In the new design, the hopper feed mechanism has been improved and a new selector mechanism provided which will handle special work, such as slotted and castle nuts, and deliver them to the stationary straight shank tap so that they all face the same way. The hopper disk



is rotated intermittently by a duplex ratchet pawl, which is said to assure correct feeding for all types of work.

The pusher mechanism which advances each nut into the work-holding jaws is entirely new. Operated through a feed cam and change gears, the mechanism is adjustable to accommodate nuts of various thicknesses and the pusher-tip has a ball bearing which allows it to rotate with the nut without marring it. Automatic safety throw-outs stop the machine automatically, thus minimizing

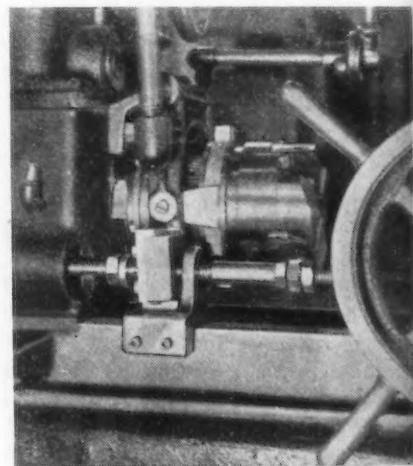
tap breakage and preventing damage in case imperfect blanks or other obstructions interfere with the normal operation of the mechanism. The tap holding and nut stripping mechanism has also been redesigned. The tap is held in place by two pair of clamping arms which open and close

alternately. In the illustration, the left-hand clamps are shown closed on the shank of the tap while the right-hand pair are open. The tapped nuts are intermittently pushed along the tap shank by a pair of vertical spring fingers and two horizontally actuated claws. These claws are synchronized to operate with the opening and closing of the clamps. While the first claw is advancing the nuts past the corresponding open clamp to a position between the second pair of stationary guide fingers, the second claw remains inoperative until the clamps have alternated their position, thus allowing the second claw to engage the nuts preparatory to completing the stripping action. The nuts then drop off the end of the tap into a trough.

#### Die Head Attachments

**A**MECHANISM for instantaneously opening the 7V Lanco hardened and ground die head has been developed by the *Landis Machine Co.*, Waynesboro, Pa. The unit is comprised of a spring in combination with a latch block in addition to the con-

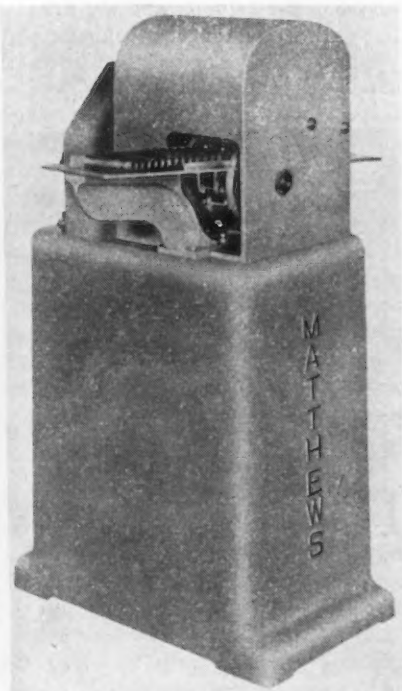
ventional yoke employed to open and close the head. When the head is in the closed position, the yoke locks independently of the die head. As the yoke closes the head, spring tension is built up in the extension spring, one end of which is anchored to the machine bed and the other to the yoke. As the threading operation progresses to the point where the die head is to be opened, a sleeve on the trip rod



raises the latch from the latch block, thus releasing the yoke and permitting it to snap back quickly, causing the head to open instantaneously.

#### Color Band Printing Machine

**A**MACHINE for printing color bands, insignia and other data on cylindrical bodies of grenades, signal flares, cartridge cases, etc., at a rate of 3000 to 4000 pieces per hr. has been developed by *Jas. H. Matthews & Co.*, Pittsburgh. It can be designed for printing one or more colors. Parts are placed by hand into an input gravity feed chute and rolled by gravity to the printing unit, which consists of a printing plate cylinder into which interchangeable synthetic rubber type is placed; ink pan, roll and doctor which places ink on the face of the printing plate; and multiple stage



2948 Kishwaukee Street, Rockford, Ill. The machine has 12 in. maximum stroke, and will slot to the center of a 48 in. circle. There is approximately 18 in. minimum space under ram guide, with ram adjustment of 15 in. Cutting speeds are infinitely variable between 10 and 75 ft. per min.; maximum ram return speed is 100 ft. per min. The circular table is provided with T-slots in four directions. Final drive to table is through a worm and gear. The ram is mounted in an independent housing, pivoted to tilt forward at the bottom to 10 deg. from vertical. It has powerful hydraulic drive from a cylinder mounted directly in the rear. Throughout

it is claimed that when used in proportions of 3 to 5 per cent of the oil in the system, it puts any accumulation of sludge, gum or contamination into solution. Changing worn oil becomes only a matter of draining the hydraulic line and refilling with fresh oil, thus saving considerable time. It is also claimed that Gum Solvent "B" promotes smoother production of all hydraulically operated machinery.

#### Swiss-type Automatic Screw Machine

**F**IVE cutting tools controlled by flat cams equipped with both lateral and vertical micrometer adjustments give complete control in turning various diameters, shoulders, radii and angles on the Swiss-type automatic screw machine built by Thomas B. Gibbs & Co., Delevan, Wis. On the Swiss type automatic screw machine, the single point forming and turning tools are provided with in-feed only, and the stock is not only rotated to give the speed function, but is also fed axially through a bushing whose face is just a few thousandths of an inch away from the plane of the cutting tools. Knurling, drilling and reaming, threading, counterbor-



ing or tapping are done in one operation. The continuously variable spindle speeds are from 1,000 to 10,000 r.p.m. To provide the widest possible machine use, the following attachments are available: Single spindle drilling attachment for both positive and sensitive drilling; single spindle threading attachment for cutting outside threads of various diameters,

cradle rolls which hold pieces to be printed. The part is picked up by one cradle roll and advanced to the printing stage. The piece is printed, and cradle then moves forward and automatically deposits the printed piece on a gravity takeaway chute. The machine uses quick-drying liquid inks, either dye or pigment colors, and parts can be handled within 30 sec. after printing.

#### Hand Screw Machine

**P**RODUCTION attachments are now available to convert the Atlas F-series 10-in. lathe into an efficient handtype screw machine for the rapid production of small precision parts. The addition of independent or universal chucks adapts this equipment to turret lathe work. Included in the set are: Lever-type collet chucks of ½-in. capacities for ¾-in. bits; turret with 4-way tool post and backslide tool post tail-stock turret for six operations; multi-stop attachment for gaging length of cut; reversing switch and spindle nose cap. Lathe is equipped with reversible power cross feed and longitudinal feed, V-belt drive and tapered roller spindle bearings. Swing over bed is 10¼ in. with a capacity 18 to 36 in. between centers in four bed lengths. Machine is made by Atlas Press Co., Kalamazoo, Mich.

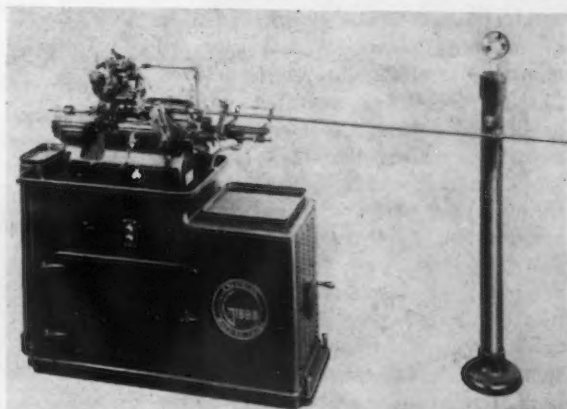
#### Vertical Slotter

**T**HE 12 in. Hy-Draulic slotter, having hydraulic ram-drive and hydraulic feeds, has been developed by the Rockford Machine Tool Co.,

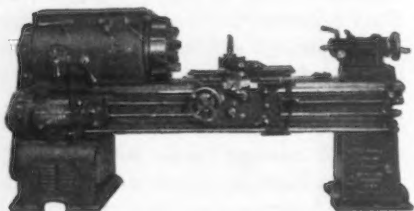
each cutting stroke the drive supplies uniform speed and constant cutting pressure even on intermittent cuts. Hydraulic feed is infinitely adjustable between 0 and 0.106 in. per cutting stroke for transverse movement, between 0 and 0.053 in. for longitudinal movement and between 0 and 0.106 in., on a circle 6 in. in diameter, for circular movement.

#### Gum Solvent for Hydraulic Oils

**A**GUM solvent in concentrated form, to be added to the oil in a hydraulic system whenever there is evidence of poor indexing or improper operation, is the product of E. F. Houghton & Co., 303 West Lehigh Avenue, Philadelphia. Known as Gum Solvent "B,"



such as screws, armatures' shafts and related pieces; two-spindle drilling and tapping attachment for performing both drilling and tapping operations in one production cycle; three-spindle drilling attachment which can be used for spotting, drilling and reaming; and slotting attachment.



#### Hollow Spindle Lathe

**L**ATEST addition to the line of Hydratrol hollow spindle lathes made by the *Lehmann Machine Co.*, St. Louis 3, is the 18 in. swing machine with 7½ in. hole in spindle, shown in the accompanying illustration. This is the smallest unit of the line, the other sizes ranging up to 36 in. swing with 16½ in. hole. Hydraulic brakes and clutches, hardened bed ways, automatic lubrication and control are featured in all sizes. A large size turret may be mounted on the carriage as ample power is provided for multiple tool work. Beds may be had on either side of the headstock.

#### Back Spotfacing Machine

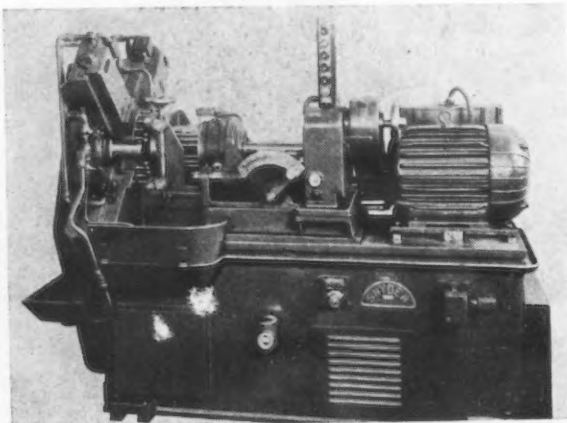
**T**HE multiple spindle hydraulic back spotfacing machine built by the *Snyder Tool & Engineering Co.*, 3430 East Lafayette Avenue, Detroit, has been designed to back spotface at one time the entire set of bolt holes in the cylinder barrel flange of certain types of aircraft engines. The cylinder head assembly is loaded in a horizontal position and clamped manually in place on a sliding fixture. Cutting tools are mounted on hydraulically actuated tool slides, which move away from the work to facilitate loading. After the part is clamped in place, the cutters are brought into correct working position and then the multiple spindle driving head is manually advanced so that the drivers pass through the bolt holes and engage the cutting tools for spotfacing. The working cycle consists of rotating the tools under power

and feeding the cylinder head against the cutters. When the full depth of cut has been made, the tools dwell in the work momentarily to assure a smooth machined surface. The base of the machine contains coolant as well as the hydraulic tank and piping.

#### Drilling Machine

The M-100 model sensitive drilling machine introduced by the *Sigourney Tool Co.* is being distributed through Pratt & Whitney, Division Niles-Bement-Pond Co., East Hartford, Conn. The machine, with the exception of the chuck and drill, is fully enclosed, lessening injury hazard to inexperienced operators. The unit incorporates extra weight and strength to give ruggedness and maintained accuracy under 24-hr. operation schedules.

The standard M-100 operates at

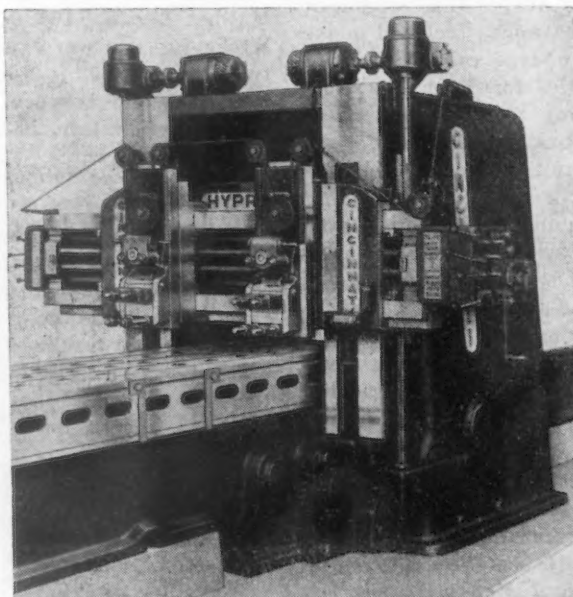


spindle speeds of 4000, 7000 and 10,000 r.p.m., but with special motor can operate at lower speeds. The motor is held in vertical position en-

closed in the column, and the drive is through three-step cone pulleys with V-belt. Flexibility in sizes of work handled is provided by the use of space blocks of varying sizes, which allow increased distances from table top to chuck when inserted between column and base. Additional flexibility is possible with another model, the M-100A, which allows 7 in. from face of column to center of chuck as opposed to the 4½-in. horizontal distance which is afforded by the M-100. Both models are available in single or multiple spindle design. Foot treadle is also available.

#### Frog and Switch Planer

**D**EVELOPED by the *Cincinnati Planer Co.*, Cincinnati, the Hypro frog and switch planer has double length enclosed bed with extra deep housing cheek bearing to the bed. The combination herringbone balanced drive is built to carry 100 hp. The rail and down feed screws are of extra large diameter, and a long bronze nut is mounted near the top of the slide, accessible for taking up of backlash. Counterbalanced inverted dovetail slides prevent dropping of the slide and consequent hammering of the screw in the nut as the tool strikes the cut. Instantaneous rail lift is optional equipment. Heads and slides can be fed and traversed in any direction, independently or together. Both heads may be moved manually in either the same or opposite directions simultaneously, with a single crank. There is a special jogging device for feeding the tool into the work for tapering and trimming as the table moves in the cut direction.



# Efficient materials-handling with Exide-equipped industrial trucks helps ease manpower shortage!

## Production costs cut through increased efficiency

Efficiency must be today's keynote. Manpower shortages permit no waste motion or space, and fast-moving, battery-powered, industrial trucks mean big savings. They permit faster loading, unloading of materials... their use increases the effectiveness of every available man, and permits women to perform tasks formerly considered too heavy for them. Combined with modern methods of palletizing unit loads of almost every material, industrial fork trucks make possible higher stacking, with a consequent increase in vital storage space, and give you many important savings.

### HANDLING OF PALLETIZED UNIT LOADS

Although many kinds of modern materials-handling equipment are used in efficient operations of loading and unloading, there are definite advantages to the palletized unit load. Here are some of them, using forked truck pallet and tractor-trailer systems of handling.

- 1 Handling-time cut 25-75%; particularly in unloading railroad cars and trucks.
- 2 Volume of damage reduced by elimination of many manual bucket-brigade handling operations.
- 3 Capacity of warehouses increased through higher tiering of palletized materials.
- 4 Enables use of less skilled help, including older men and women.
- 5 Simplifies inventory-taking, sorting, and inspection operations.
- 6 Reduces accidents, and often prevents them.
- 7 Makes rodent and vermin control simpler through better housekeeping methods.

The success of the war depends upon speedy movement of men and materials. Standardization of packing methods and materials-handling equipment accelerates the movement of materials at home and on the fighting fronts.

### EXIDE-IRONCLAD BATTERIES OFFER THREE VITAL POINTS OF SUPERIORITY

- **MORE POWER, MORE PRODUCTION:** An Exide-Ironclad delivers its power at uniform voltage to assure constant hauling speeds. There is always a giant surge in reserve when an Exide powers your battery propelled vehicles.
- **LONG LIFE SAVES MATERIALS:** Every Exide is built to last, and saves vital materials by squeezing the last ounce of use out of the materials in it. When you buy an Exide, you definitely... Buy to Last and Save to Win.
- **EASY MAINTENANCE, SAVES LABOR:** Exides are kept charged by the simplest method ever devised. With the Exide Charge Control Unit all you do is connect battery to the charging source and turn a knob.

**Exide**  
IRONCLAD  
BATTERIES



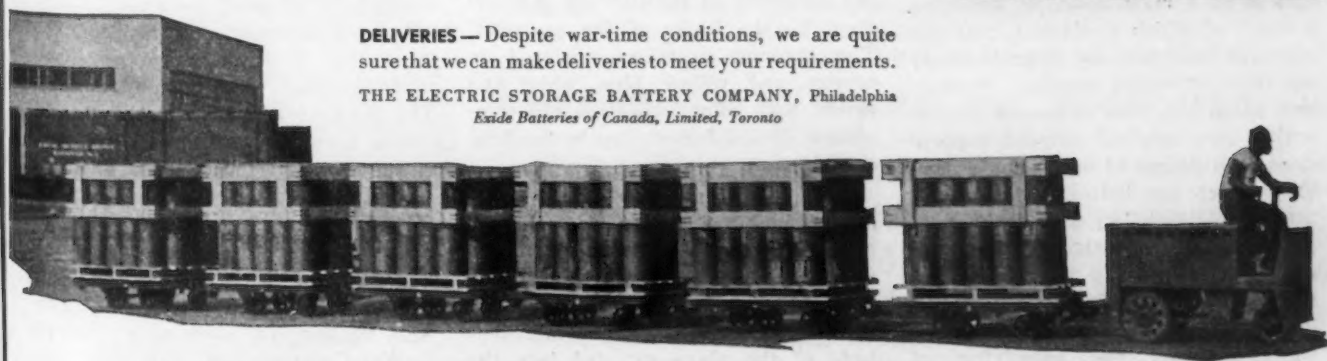
Forked truck loading bagged materials into a railroad freight car. One man handles the work of many.



Forked truck stacking palletized unit load. This method doubles storage capacity of warehouses.

**DELIVERIES**—Despite war-time conditions, we are quite sure that we can make deliveries to meet your requirements.

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia  
*Exide Batteries of Canada, Limited, Toronto*



Tractor-trailers speed-up loading operations. Palletized loads can be placed on trailers by forked trucks, hauled to storage or shipping points and unloaded by forked trucks for additional speed and prevention of materials-damage.

# Assembly Line . . .

STANLEY H. BRAMS

• A. C. Spark Plug Division employs conveyor lines effectively to produce British T-1 bomb-sight . . . Chevrolet starts operations in its newest aluminum forge . . . Civilian truck output stymied.



**F**LINT—The A. C. Spark Plug division of General Motors Corp. produces 459 war products. Announcement was made last April that this division was manufacturing the highly complicated Sperry automatic pilot, but it was not till last week that public release was permitted of the fact that A. C. is producing a bomb-sight as well—equally as complicated an instrument of modern war.

The A. C. product is the T-1, a British unit which seems designed specifically for comparatively low level bombing at night. Its working mechanism contained in a box the size of a suitcase, the T-1 includes in that constricted area 4,212 pieces, many of them held to precision limits from .0002 to .0008 in. Cost per unit is more than any automobile. Manufacture is on a mass assembly basis, as a result of which production time per unit has been reduced approximately one-third in recent months. Production speed has been enhanced considerably over original English conceptions by utilizing 14 major sub-assemblies which are bolted along a final assembly line to an aluminum main base, said to be the largest type pressure die casting ever made, requiring 14 lb. of aluminum per unit.

Other changes from original designs included the specifying of aluminum, brass and bronze in place of iron and steel, the effect being to

reduce the weight of the completed assembly from 85 to 55 lb. Problems which were met and surmounted in A. C. manufacture involved the development of new oils and greases for bearings and flex shafts which can operate over a temperature range from minus 60 deg. F. to plus 160 deg. F., along with unspecified steps taken to prevent unequal expansion causing binding of shafts and gears at these extreme temperature ranges. A trail cam presenting a graduated surface, whose dimensions had to check to .005 in. at several hundred different points, was originally made out of a series of metal sections; in the modified A. C. design, this part was molded of a special bakelite composition, which requires only the tapping of two holes at each end.

**M**UCH of the success of the A. C. program has been due to its conveyorizing of the entire operation. For final assembly a conveyor line approximately one-third of a mile long operating in a closed circle is loaded each morning with sub-assemblies from central stock rooms. A set of two trays carry complete complements of the 14 sub-assembly parts required, a third tray conveys bases, while an assembly jig is conveyed in a fourth. The final assemblers remove parts from this constantly moving conveyor as necessary.

At the end of the final assembly line the completed units move to checking and teardown stations operating along another conveyor. Inasmuch as women alone are used in this department, provision had to be made for convenient handling of the assemblies, done by providing lifts through sections of the work tables. The assemblies are moved onto an elevator section, and a button control raises the assembly to position for engagement by the hooks of the conveyor. The hooking units are colored in orange, red, yellow, blue, white and green, each color indicating the completion of a different step in the final checking.

The T-1 is what is known as a "predictor" sight as contrasted with the Norden "pre-set" sight. In a predictor sight the height, air speed, wind speed, wind direction and air characteristics of the bomb and attitude of the plane are fed into the working mechanism.

Shafts from the mechanism actuate



**SHRUNK STAMPING:** Making a big stamping and a little one from the same die is all in the day's work for W. E. Edwards of the Schenectady works laboratory of General Electric. Stamped from the same die, the one at the right was passed through a hydrogen furnace 200 times instead of once and has shrunk.

the sight proper, where the bombardier looks upon the terrain below him through a glass on which cross-bars are reflected. During the few seconds of the bombing run, the bombardier directs the pilot along a course which carries the area to be bombed across his glass, permitting release of the bomb loaded at the time the objective passes through the cross hairs. The location of the cross hairs on the glass is controlled by the working mechanism during flight, as is the visible ground area. This system generally is in contrast to preset sights, in which automatic release of the bomb load is made when the plane reaches the predetermined area. The T-1 system permits more flexibility in evasion tactics than does the Norden, but the advantages and disadvantages of each type of sight dictate the conditions under which they are best used.

**C**APACITY of Chevrolet for production of aluminum aircraft forgings started toward a new peak Wednesday, Nov. 3, when operations began at a fourth aluminum forge of

IT'S NEW! IT'S LIGHTER! IT'S FASTER!

*Greenfield's* #1618

Rapid inspection  
limit snap gage

SEE HOW  
THE LONG ANVIL  
SIMPLIFIES YOUR WORK



- 1 It is especially adapted for gaging lengths of recessed or drawn parts. Equally suited to gaging diameters of round parts.
- 2 It enables the operator to quickly locate and level the work before moving it towards the "Go" and "Not Go" anvils.
- 3 Aligning the work with the measuring points permits more rapid handling and faster output.
- 4 It tends to eliminate the uneven wear of the lower anvil often shown on the conventional style gage caused by uneven approach of the work to the gage.
- 5 On work in the machine, it facilitates rapid checking of diameters.

"Greenfield" is happy to present this newer, faster gage at just the time when speed with accuracy is so greatly needed. This No. 1618 gage is considerably lighter than the conventional snap gage of the same capacity, yet its design assures strength and rigidity.

Write today for descriptive pamphlet, giving full specifications.

**GREENFIELD TAP AND DIE CORPORATION**  
GREENFIELD, MASSACHUSETTS

Detroit Plant: 5850 Second Blvd. Warehouses in New York, Chicago and Los Angeles



**GREENFIELD**

TAPS . . . . DIES . . . . GAGES . . . . TWIST DRILLS . . . . SCREW PLATES

that division, located at Anderson, Ind. Formerly owned by the American Steel & Wire Co., the Anderson plant has been completely reconstructed and equipped since its acquisition early this year by the Defense Plant Corp.

Four buildings make up the operation as it now stands. Two of the plant units, each nearly 550 ft. long, will be used in processing work and will house the heat-treating furnaces. A third houses testing laboratories and plant cafeteria. The fourth is the aluminum forge plant itself, where heavy hydraulic presses and upsetters have been installed.

Some of the equipment in the forge is the heaviest and largest in use anywhere in the country. In early stages of installation now is a bank of four Clearing mechanical presses, each of 4,000-ton capacity, said to be the largest such units ever built by this company. There will be two hydraulic presses, one now installed, built by Hydraulic Press Co., each of 3,000-ton capacity. There is an Ajax upsetter which weighed 353,000 lb. before installation.

In addition to these buildings, two former storage structures, now rebuilt, provide space for main office, personnel department and engineering staff. The new unit is operated under the Chevrolet forge plant at Muncie, Ind., whose manager, H. A. Leary, will supervise operations. Resident plant manager is J. L. Coyle, and the plant engineer is W. J. Massey, Jr.

Shadow boxing with unrealities appears to have ended in regard to the current and forthcoming schedules for civilian truck manufacturing. Joseph B. Eastman, director of the ODT, told the American Trucking Association convention that very little output will be completed in civilian truck fields this year and no substantial production can be anticipated for at least the next six months. This confirms predictions made earlier here.

As against the output of 7,500 heavy duty vehicles, 4,100 of them trucks, authorized for the last half of 1943, actual production this year was expected by Eastman to total not more than 100 trucks, 2,500 truck-trailers and 1,200 integral buses. The indications are that for the 32,000 heavy and medium truck allocations for the first half of 1944, a similarly small proportion will be produced. This has been expected in informed industry circles; it is the reason some major truck makers did not appear on the 1944 production allocation lists.

They were pessimistic over prospects to the point that they turned down offers to produce.

The crux of the problem lies in the difficulty of obtaining components, even though parts for heavy trucks and certain others have been advanced from the AA-2X level to AA-1. Manufacturing priorities at a AA-2X level do not stand a ghost of a chance for delivery today, and with one integral part missing a truck maker can't produce, no matter how many other components are at hand. Even at the AA-1 level, civilian truck needs are no more than equal with the military truck priority rating; Army officials at supplier plants are said to see to it that their service arms get the best break when priority ratings are equal.

### Grandy Named to Head Steel Warehouse Association Cleveland

• • • Clayton Grandy, former chairman of the planning committee and trade association director of the Industrial Salvage Branch of the WPB, Salvage Division, has been chosen as executive secretary of the Steel Products Warehouse Association, Cleveland. The appointment was made by the Board of Trustees of the association after an exhaustive search for a qualified executive officer covering a period of four months.

Mr. Grandy is a member of American Trade Association Executives, and a past president, director, and

The civilian truck makers have asked Washington to guarantee them by directive a total of 15 per cent of vehicle components scheduled for manufacturing, saying this will be sufficient to meet their needs, and thus fill the urgent civilian requirements. However, no action has yet developed on this.

Accordingly, inquiries to steel mills for tonnage to meet the civilian truck program are scarce. The general situation seems to be that the truck makers are avoiding making any commitments until they have the components in sight. This factor, coupled with the tightness of sheets required for bodies, casts a rather gloomy hue over the civilian truck program as now projected.

secretary of its Cleveland Chapter.

Here is the list of Trustees and Officers chosen by the regional groups:

#### Chicago Group

Chairman, William G. Weiss,\* Midland Steel & Equipment Co.; vice-chairman, Phillip P. Brown, Reliance Steel Corp.; secretary, Sol Fox,\* National Sheet Steel Co.; treasurer, Henry Angsten,\* Corey Steel Co.; trustees, Harry F. Alpin, Briggs and Turivas; William G. Weiss,\* Advisory Committee: The officers and trustees.

#### Cleveland Group

Chairman, Harry Resnick, Universal Steel Co.; vice-chairman, M. S. Phillips, Lake Erie Steel & Blanking Co.; secretary, David Moritz,\* Regent Steel Co.; treasurer, H. J. Mervis,\* Singer Steel Co.; trustees, Albert Singer, Singer Steel Co.; Harry Resnick,\*

Advisory Committee: The officers.

#### Detroit Group

Chairman, Joseph Gendelman,\* National Sheet Steel Co.; vice-chairman, Laurence Carolin,\* Stanton Steel Co.; secretary-treasurer, Maxwell Jospey,\* Production Steel Co.; trustees, Joseph Gendelman,\* Laurence Carolin,\* Advisory Committee: The officers and Jules Solomon of United Steel Sales.

#### Valley Group

Chairman, J. E. Lavine,\* Union Steel Supply; vice-chairman, Harry Hoffman, Wilkoff Co.; secretary-treasurer, R. J. Levy,\* Allied Metals; trustees, Donald C. Lott,\* Tin Mill Products Co.; J. E. Lavine,\*

Advisory Committee: The officers.

\*Reelected.

### New Ford Plating Plant Ready to Open

#### Detroit

• • • The latest addition to the Ford Motor Co. electro-plating department, reported to be the largest in the world, will be in operation within a few weeks.

It is located in the Aircraft Engine building at the Rouge plant and will consist of five bays, each 160 ft. by 25 ft. in size.

The new division will provide facilities for lead, indium, silver and lead flash treatment of bearings used in Pratt & Whitney aircraft engines.

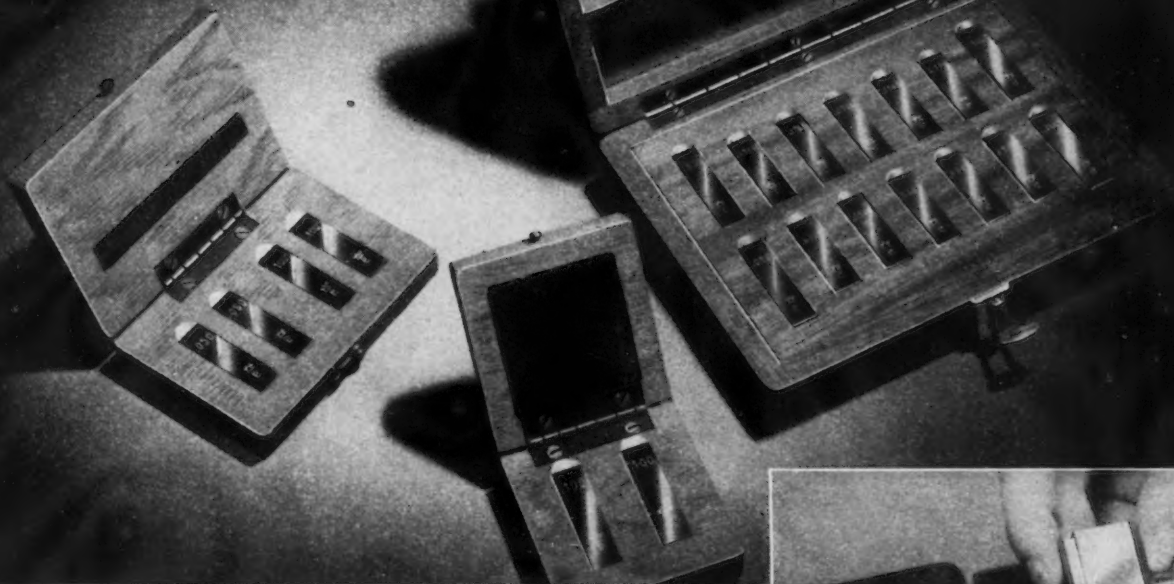
The Ford electro-plating dept. now is operating divisions in buildings of the Rouge plant, at the Highland Park plant and at plants in Kansas City, Kan., Memphis, and St. Paul.

### Annual Meeting Nov. 19 For Steel Products Jobbers

• • • Leaders from government and industry will discuss war-time problems and peace-time prospects of the steel warehousing industry at the annual meeting of Steel Products Warehouse Association, Inc., on Nov. 19 at the Drake Hotel, Chicago.

In a highlight of the meeting, the speakers will be joined by government officials in a Panel of Experts to answer questions on manpower controls, CMP, warehouse regulations, price schedules, and steel redistribution.

# Carblox CEMENTED-CARBIDE GAGE BLOCKS

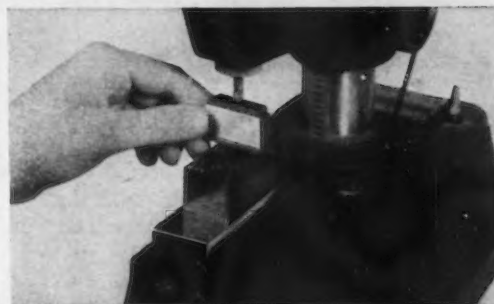
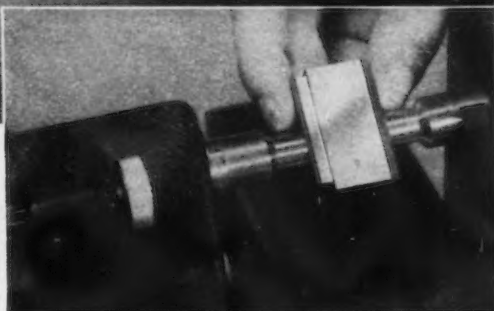


## ...for WEAR RESISTANCE WHERE IT IS NEEDED . . . IN END BLOCKS IN GAGE BLOCK BUILD-UPS

Innumerable applications are being found for Carblox—the cemented-carbide gage blocks which retain original accuracy at least fifty times longer than steel blocks. They are being used in setting adjustable and solid snap gages, supermicrometers, measuring machines, jig borers and grinders, sine bars, amplifiers and dial gages, and in many other applications where gage blocks are ordinarily subject to wear.

Carblox supplement standard sets of steel or chrome plated gage blocks and are manufactured for use on each end of a build-up, serving as protective anvils and preventing wear on the less wear-resistant blocks. As a result, they increase the usable, accurate life of all gage block sets. In addition, their use largely eliminates the customary necessity of checking blocks, and reduces to a minimum scrap or rejections that might result from the use of worn gage blocks.

Literature describing Carblox in full detail and listing prices will be sent you immediately upon request . . . no obligation, of course.



## LINCOLN PARK TOOL and GAGE CO.

LINCOLN PARK, MICHIGAN

• Wasting of alloy materials through improper scrap segregation and utilization causes concern . . . WPB expected to swing bulk of alloy steel to electric furnaces as conservation measure.



WASHINGTON—Concern is being shown over the wastage of alloy materials in the open hearth and electric furnaces. While it has not reached the point of government action, definite proposals to solve the problems are beginning to crystallize. The annual loss of three alloys, nickel, chrome and molybdenum is estimated at 3,900,000 lb. Broken down, the wastage of nickel is placed at 2,000,000 lb., of chrome at 1,500,000 lb. and of molybdenum at 400,000 lb.

This loss is attributed to (1) the mixture of alloy with carbon scrap, and (2) to the necessity of diluting charges with carbon scrap to bring steels within required specifications. The reason for the dilution is that home and purchased scrap are frequently higher in alloy content than the original metallic material. This monthly mixture of carbon with such alloy is fixed at 200,000 tons or about 20 per cent of the total charge. The result, it has been pointed out, is a wastage of residuals.

To assure better recovery of alloy by reducing the wastage through more careful processing informal suggestions have been made that OPA should impose a price penalty for inclusion of excess alloy scrap in carbon scrap. At present 52 per cent of the nickel, 34 per cent of the chrome and 44 per cent of the molybdenum is supplied in the form of scrap. It has been proposed that an order be issued requiring that these percentages be lifted to 65 per cent nickel, 45 per cent chrome and 55 per cent molybdenum. It is contended by companies that prefer virgin alloys that the pro-

duction time lost through getting a higher percentage of alloy from scrap would not be compensated for by the money gained stemming from alloy savings.

Outside of stainless and tool steel, the monthly alloy steel production is 900,000 tons. The scrap generated is 609,000 tons, a difference of 291,000 tons between production and scrap recovery. This means that the scrap recovery is above 66 per cent of the alloy output.

From the charge in the electric furnace to the ingot, figures show, there is a 7.4 per cent waste, due to oxidation, pit scrap and splashings. This loss alone cuts the ingot weight to 92.6 per cent of the total metallic charge. In the open hearth making alloy steel, the waste from these causes is 11.3 per cent, giving the ingot 88.7 per cent of the weight of the metallic charge. Hence to make 900,000 ingot tons of steel, a metallic charge of 1,001,000 tons is required. From the ingot to finished alloy steel the loss in the case of the open hearth furnace is 39.6 per cent. In the case of the electric furnace the loss is only 37.8 per cent. That is to say, the finished production in the open hearth is 60.4 per cent of the ingot while in the electric furnace the percentage is 62.2.

THE revert scrap recovery for both types of furnaces is 352,000 tons monthly. The monthly pit scrap amounts to 30,000 tons, including ladle skulls; consumer turnings, 133,-

000 tons and consumer scrap solids, 94,000 tons. The monthly open hearth and electric furnace consumption of revert scrap for making alloy steel is 316,000 tons. Consumer purchased scrap consumption is 85,000 tons and the synthetic scrap melt is 29,000 tons. The blast furnace uses 30,000 tons of alloy scrap monthly in the production of alloy pig iron. This total of monthly scrap consumption is 460,000 tons. Approximately 40,000 tons of alloy scrap monthly is mixed with purchased carbon scrap. Comparing the 609,000 tons that are generated, the difference of 109,000 tons is excess or unused scrap—or an annual accumulation of more than 1,300,000 tons that is not used.

The weighted average analyses of all carbon scrap is 0.30 molybdenum and 0.80 nickel, according to an industry source. These residual alloys make their way into carbon steel and are therefore wasted. At the same time the seller does not get a higher price for his steel and the buyer receives a product whose specifications exceed those covered in his order.

The average chemistry of all alloy steel is 0.89 nickel, 0.62 chrome and 0.18 molybdenum. On the other hand, the average content of revert or home scrap is 1.04 nickel, 0.69 chrome and 0.19 molybdenum. An illustration of how alloying elements increase in percentage over original analyses is seen by comparing the amount of scrap generated by a low alloy product with a higher alloy product.

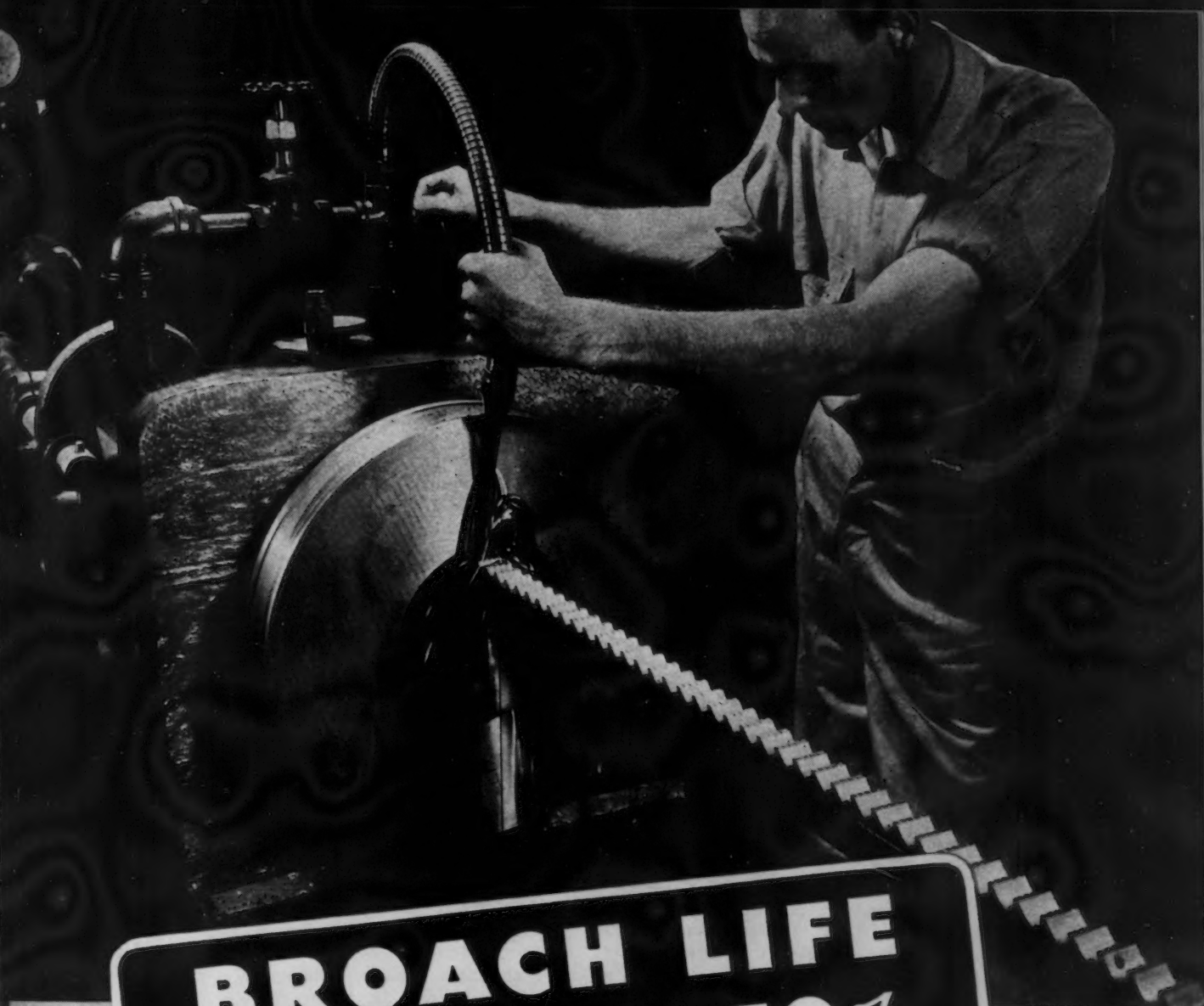
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WFB-012



**BROACH LIFE  
BOOSTED 50%**

**SUNICUT**

**eliminates 1 out of 3 broach changes . . . ups production"**

all again as many parts for war machines broached between every tool change! That's the answer a certain well-known metal-working plant made to the demand for increased war production . . . an answer made possible through the use of Sunicut sulphurized cutting oil recommended by a Sun Doctor of Industry.

Previously the time lost in changing and resharpener broaches put a drag on production . . . so a Sun Oil engineer was consulted. After a careful survey of conditions a change to Sunicut 196 cutting oil was advised with the result that broach life increased 50%! One-

third of the time formerly lost changing broaches is now employed productively in turning out more pieces per day.

War plants everywhere—out to step up production—are finding the high heat-absorbing and metal-wetting qualities of Sunicut an important aid. On automatics, semi-automatics, gear-cutting machines as well as broaches, let Sunicut help you turn out a better job . . . faster . . . with maximum tool life. Discuss it with a Sun Doctor of Industry today. Write

**SUN OIL COMPANY • Philadelphia**  
Sun Oil Company, Limited, Toronto, Canada



**SUN INDUSTRIAL PRODUCTS**

**HELPING INDUSTRY HELP AMERICA**

nary bar stock is 0.45 nickel, 0.40 chrome and 0.15 molybdenum, with shipping weight of only 30 per cent of the original stock, with a shipping weight of about 70 per cent of the tonnage of the original bar. Higher quality steel such as forged armor has 3.85 per cent nickel, 1.75 chrome and 0.30 molybdenum.

**T**HE WPB drive to transfer alloy production from the open hearth to the electric furnace gains force by reason of the less waste in the latter unit. At present about 68 per cent of the alloy steel output comes from the open hearth furnace. Therefore there is still a wide leeway for increasing the alloy production in the electric furnaces. Also this will further lessen waste and at the same time step up carbon steel production, which has become increasingly important by reason of the loss of tonnage through coal strikes.

Carbon steel producers have surrendered high-paying tonnage in favor of electric furnace operators at WPB request but not without objection. Likewise electric furnace operators have criticized carbon steel producers whose alloy output deprived the former of orders. But at WPB emphasis is being placed on getting out the right kind of production at the right time for war use.

## OCR Seen As Key Post-War Agency To Facilitate Industrial Conversion

### Washington

• • • With talk of mid-war and post-war conversion floating through the halls of WPB there are officials who believe that the Office of Civilian Requirements, or an agency embodying the principles of OCR, will be the WPB of the post-war world. However, other sources think that in view of the setting up of the Office of War Mobilization by the President this office under James Byrnes will take over.

OCR rapidly has been expanding and attracting experienced men from other WPB divisions and as Arthur D. Whiteside, OCR chief, recently pointed out, civilian production now has a spokesman. OCR is achieving more for civilians than did its inept predecessor, the Office of Civilian Supply.

As military requirements have become more clearly defined the emphasis has been slowly shifting to civilian goods production.

Further evidence of WPB's implementing the work of civilian manufacturers is the recent decentralization plan which grants smaller manufacturers of civilian goods controlled

materials on an annual rather than quarterly basis.

OCR's post-war planning is embodied in the production program that it presents to the WPB Requirements Committee. Material is always requested for more goods than the Committee will allow, but even though denied the materials OCR is massing information vital to reconversion.

## Crowley Consolidates Gov't Agencies for Better Operation

### Washington

• • • Foreign Economic Administrator Leo T. Crowley has consolidated the Lend-Lease administration, the Office of Economic Warfare and the Office of Foreign Relief and Rehabilitation in an effort to eliminate overlapping and duplication of operations.

The reorganization follows charges that agents abroad often worked at cross-purposes and refused to cooperate with each other.

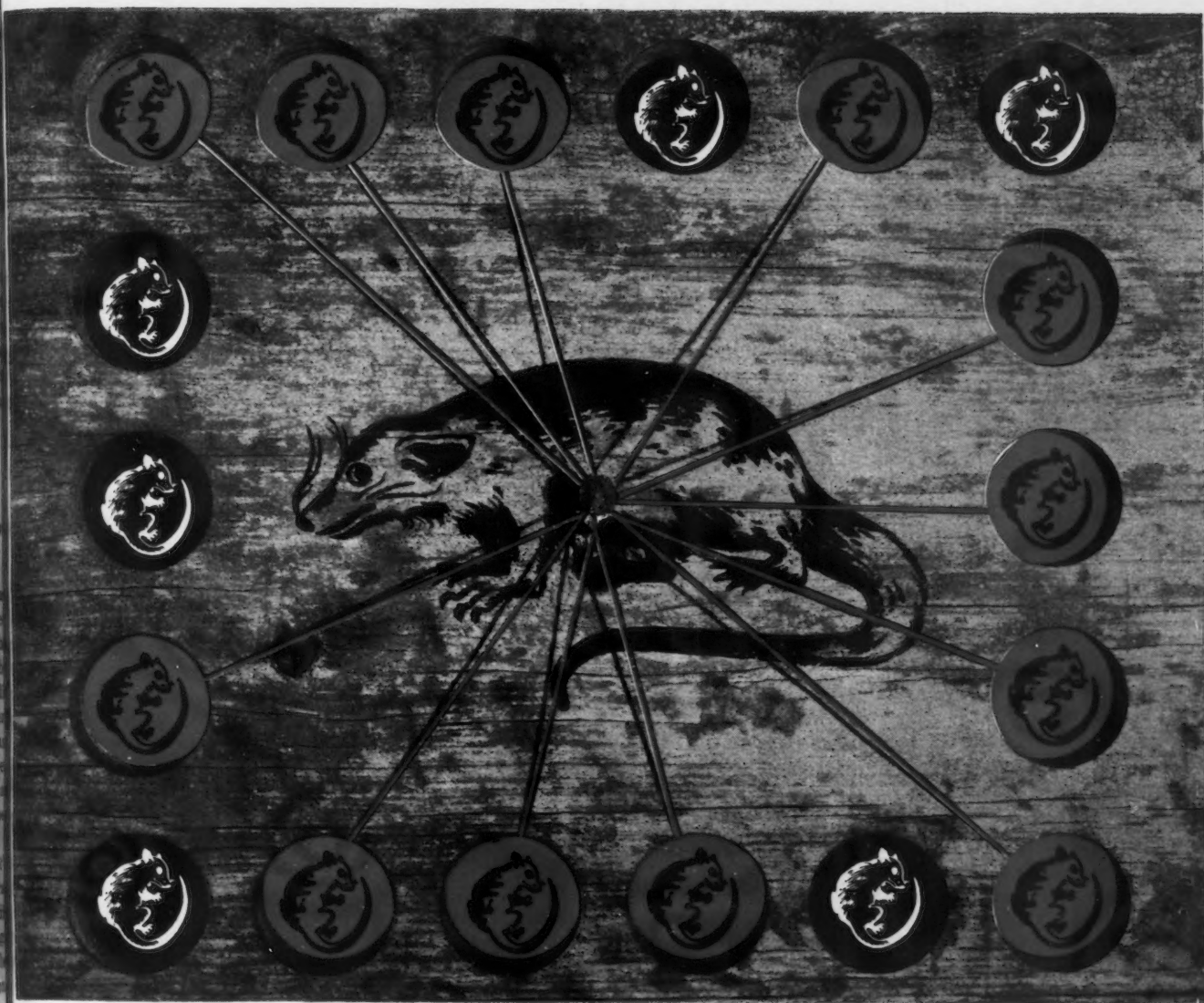
Parts of the State Department Office of Foreign Economic Cooperation and of the Commodity Credit Corp., which have economic dealings with foreign countries will also be brought under Crowley's direction. Crowley described the reorganization as "the most far-reaching consolidation of government agencies in this war," and emphasized that it would unify operations of the various agencies abroad as well as in this country.

Under Secretary of State Edward R. Stettinius, Jr., said Assistant Secretary Dean Acheson will be in charge of the special advisers who are to work with Mr. Crowley's organization.

## OEI Will Export Distressed Stocks

• • • The Office of Economic Warfare will accept and consider license applications to export any distressed materials, except copper and aluminum products, without an accompanying import recommendation, it was announced last week. If licensed, it was explained, such shipments will not be charged against the OEI allocation to the country of destination.





## Nature's most tragic mistake

THE POSSUM'S LITTER consists of 18 babies. But mother possum can only accommodate 12. At birth, there's a mad scramble for the 12 nipples, and the first arrivals don't budge for 6 weeks! The other 6 babies just look on...and die of starvation.

What an ironic circumstance! A mother forced by fate to watch her own babies starve! And what a pointed illustration of the ruthlessness of Nature. In Nature and in business, the fight for survival is equally vital. Failure to keep abreast of changing conditions has invariably doomed the less alert industrials to business death.

Because they affect almost everything we touch,

machine tools will be more necessary than ever in the post-war era. Machine tools are essential today to the output of the food you eat, the clothes you wear, your automobile, your vacuum cleaner, your washing machine, your refrigerator. Machine tools not only create new industries, but they create employment. They are largely responsible for our present way of life...unequalled by any other country in the world.

In our post-war era, Cone Automatic Multiple Spindle Lathes will be even more essential than they are now. Their unique advantages will help bring us all higher standards of living than we have ever known before.



**CONE Automatic Machine Company, Inc., Windsor, Vermont**

• Acceptance of 10-hr. five-day week in Southern California airframe plants uncertain . . . Large number of women workers affected heightens problem . . . West Coast dry dock facilities greatly increased.



**S**AN FRANCISCO—Like ant nests flooded by the garden hose, nearly 300,000 workers for the 12 plants of the Big Five airframe manufacturers of Southern California were uncertainly milling around when they learned of the telegraphic request of Chairman Charles E. Wilson and the aircraft production board that "management" of these plants consider going on a 10-hr. five-day week schedule such as North American Aviation adopted several weeks ago (IRON AGE, Oct. 14). That 43 per cent of the workers affected are women did not simplify the problem nor lessen the wordage. In answer to a questionnaire to 1500 manufacturers of aircraft parts in the same region, a state legislature interim committee reported that 54.4 per cent of those replying believed it was not necessary to increase working hours for women to meet manpower problems.

First reactions indicated that the approach by APG to the other plants had not been as deft as North American's to its own workers and that possible production gains might be offset by prejudice and widespread quits in advance of a fair trial.

**T**O augment Navy repair facilities on Puget Sound in advance of the Pacific push, Seattle-Tacoma Shipbuilding Corp. has been authorized to proceed with three additional drydock facilities at Tacoma, one for 18,000-ton capital combat ships, one

for 10,000-ton cruisers and one for destroyers and smaller fighting craft up to 3000 tons. Instead of two major Navy repair yards on the West Coast when war started, by the first of next year there will be four big Navy yards and additional privately operated facilities like the new Seatag installation exceeding in capacity and facilities the original Navy establishments. These repair yards are operated entirely separate and in addition to yards for new construction.

Maritime and Navy repair work is expected to increase on San Francisco Bay, Puget Sound and Los Angeles harbor as naval action increases and cargo and troop carriers are further concentrated in the Pacific. The Bremerton Navy Yard on Puget Sound says it needs 10,000 workers especially for repair jobs, and the Navy recruiting service will augment civil service and U. S. employment service. Workers will be paid while training, which is new to the Navy but standard practice among civilian yards.

When the Maritime yards building Liberty ships switch to Victories, a lot of labor should be released, at least temporarily, in the conversion. Liberties are now some 22 days on the ways and nine days at the outfitting

dock, whereas tentative plans for the Victories call for 70 days on the ways and 50 days outfitting.

Repair work requires a greater average skill and versatility, for which a higher base wage rate is paid. Moreover, all repair work is on 10-hr. shifts so that take-home wages for overtime is considerably more.

**B**ECAUSE shipbuilding is the greatest single war industry in the far West, absorbing more materials and manpower, and with an end product increasingly essential, some appreciation of the complexity of the personnel and labor relation problems in this industry is necessary to understand how difficult, and impossible of hard and fast solution, is the overall manpower problem in the far West. Of over 600,000 workers directly in shipyards on the Pacific Coast, better than half are in California, over 250,000 around San Francisco Bay and nearly 100,000 at Los Angeles harbor. At Portland are about half of the number in the San Francisco Bay area and on Puget Sound a slightly larger number than in Los Angeles harbor. This does not include employees of foundries, machine shops and sub-contractors on prefabrication.

One master agreement between shipyard management and labor cov-

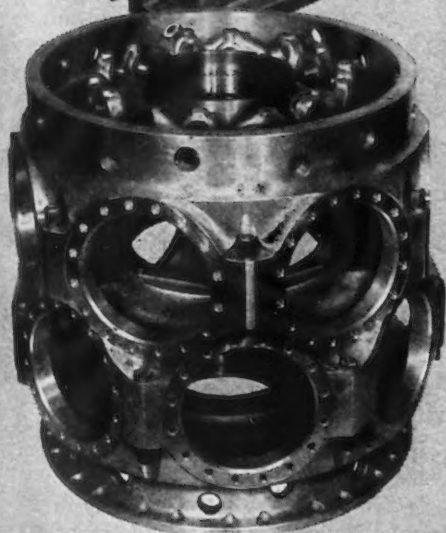
**BATTLEFIELD SCRAP:** Some of the dozen or more chassis of wrecked Axis tanks from North African battlefield which have arrived at a Bethlehem Steel Co. plant.



# *There's no substitute for* **EXPERIENCE!**



**Ex-Cell-O's wide experience in designing and building special machines to increase output and lower costs assures you practical advantages in your immediate or near future production**



*Increased production attained in precision machining of this aircraft crankcase on the above Ex-Cell-O special-purpose machine.*

**Y**ou have a substantial background of experience to draw from when you bring to Ex-Cell-O your problem in the precision machining of metal parts on a high production basis . . . whether it concerns an immediate war production job or a future product you are now planning. The more economical production of accurate metal parts necessitates single-purpose machines of improved efficiency, capable of giving greater output and reducing unit cost. For years Ex-Cell-O has been an acknowledged leader in the field of special-purpose machines . . . precision machines with exclusive features that represent the utmost in accuracy, production, operating ease, rigidity, and durability. This is why you should utilize Ex-Cell-O's experienced engineering and manufacturing facilities. Ex-Cell-O has representatives in all of the nation's principal manufacturing centers. Consult the one nearest you, or write to Ex-Cell-O Corporation Head Office in Detroit.

**EX-CELL-O CORPORATION • DETROIT 6, MICH.**



*Precision* THREAD GRINDING, BORING AND LAPPING MACHINES • TOOL GRINDERS • HYDRAULIC POWER UNITS • GRINDING SPINDLES • BROACHES • CONTINENTAL CUTTING TOOLS • DRILL JIG BUSHINGS • DIESEL FUEL INJECTION EQUIPMENT • PURE-PAK CONTAINER MACHINES • R. R. PINS AND BUSHINGS • PRECISION PARTS

★ EX-CELL-O for PRECISION ★

ers wages and working conditions uniformly for the entire Coast, applying to new construction. Separate local agreements and contracts cover ship repair work; other agreements apply to the operation of so-called uptown shops; complicated building trades craft contracts are in addition. Since it has been the policy of the national administration to maintain the sanctity of labor contracts, even in spite of radically changed conditions and war pressures, there has resulted an immensely complicated and inconsistent over-all wage structure.

For instance, in the San Francisco Bay area, for a journeyman boiler-maker, electrician or steamfitter, there are four separate base rates for the same man for the same work, depending upon the particular classification of the job he may be on. If he is engaged in new construction his base hourly wage on the day shift is \$1.20 per hour. If he is employed by a so-called uptown shop, prefabricating or sub-assembling, his base wage will be \$1.28. If he happens to be working on ship repair instead of new

construction, his wage will be \$1.34. Finally, if he is employed in the building trades, the same painter or plumber or sheet metal worker would receive from \$1.50 to \$1.70.

All new construction is on an eight-hr., three-shift basis, but all repair work is on a 10-hr., two-shift basis. A worker on repair work on the day shift receives pay for 11¼ hr. for doing 10 hr. work a day, because of an old custom that on ship repair work there is a half hour meal period with pay for every four hr. overtime or fraction thereof. Further complications are involved in calculating the time for the second or night shift on repair work. An old agreement provides that there shall be additional compensation when the second shift starts later than the regular starting time. As long as the regular day shift is now 10 hr., the night shift always starts two hours late, so that the same man on the night shift receives pay for 13¼ hr. for 10 hr. actual work.

Because of the complex upgrading possibilities involved in this mosaic pattern wage scale, there has been the tremendous turnover of employees,

constantly transferring from yard to yard and from job to job. It is estimated that there are only 4000 skilled, trained, veteran shipbuilders out of the 250,000 employees of San Francisco Bay yards. From this 4000 must come the pace setters, leadermen, foremen, and most of the repair men, because repair work requires greater general skill, versatility and experience.

By interaction of the good old laws of human nature and supply and demand, under war pressures, management has bid and rebid for the services of these skilled and trained men even under the technical restraints of wage agreements and hold-the-line stabilization orders. Take-home wages have been increased by allowing technical inducements properly payable to a premium or certified worker, to a supervisor, for overtime, for second and third shift bonuses, for improvement in classification and by transfer to a job commanding a higher wage bracket.

As scarcity of manpower has intensified and as the amount of repair work increases, these wage differentials have been accentuated. Unfortunately also, the prefabrication technique, the assembly line methods and the possibility for job analysis and subdivision where the same operation on the same type vessel is repeated over and over again, all these factors have discouraged or prevented the development of general experience. Management, on its side, has been under the gun to produce, and so there has not been the time and thought devoted to training of management technic and supervisory personnel sufficiently competent to handle three shifts in organizations as large and complex as those that have developed. One good-sized private yard recently estimated that it was only actually getting six and a half hours of productive work from its average workers during the day shift. Here there was nearly a 20 per cent loss in productive manpower daily from tardiness, time out, jumping the gun to leave and common indolence.

What, then induces a shipyard worker to do more work and what will induce more men and women to become better shipyard workers? Hard-headed industrial relations men, management counsellors and production engineers seem to agree that most of the solution must come through management in better labor relationships and utilization. Wage incentives and manipulations have been tried and result only in inflation.



### ... Cited for Awards ...

•••The following companies have recently received the Army-Navy "E" in recognition of their outstanding contribution to war production.

Davenport Besler Corp., Davenport, Iowa.

Greenfield Tap & Die Corp., Greenfield, Mass. (second renewal).

Mathieson Alkali Works, Inc., Niagara Falls, N. Y. plant (white star).

McGraw Electric Co., Elgin, Ill., plant.  
Ceco Steel Products Corp., manufacturing division, Cicero, Ill.

Askania Regulator Co., Chicago.

T. J. Edwards, Inc., Boston.

Barnes Mfg. Co., Mansfield, Ohio.

Beaton & Corbin Mfg. Co., Southington, Conn.

Chance Vought Aircraft Div. of United Aircraft Corp.; main plant, Fairfield Avenue plant, Hollister Avenue plant, South Avenue plant, Stratford, Conn.

Chiksan Tool Co., Brea, Cal.

Davey Compressor Co., Kent, Ohio.

E-J Electric Installation Co., Nashville plant, Tenn.

Farrell Mfg. Co., Joliet, Ill.

General Mills, Inc., mechanical division, Minneapolis.

Hastings Mfg. Co., Hastings, Mich.  
Hewlett-Packard Co., Palo Alto, Cal.  
Highway Trailer Co., Edgerton, Wis.  
Johnson City Foundry & Machine Co., Johnson City, Tenn.

Missouri Valley Bridge & Iron Co., shipbuilding division, Evansville, Ind.

Moore Equipment Co., Stockton, Cal.  
National Electric Machine Shops, Inc., Washington.

Portland Co., Portland, Me.  
Reed & Barton, Taunton, Mass.

Walter Scott & Co., Inc., Plainfield, N. J.  
Seattle-Tacoma Shipbuilding Corp., Tacoma yard, Wash.

Soule Steel Co., San Francisco.  
James Stewart & Co., Inc., Bethpage, L. I.

Western Pipe & Steel Co. of California, San Pedro shipbuilding division, San Pedro, Cal.

Willson Products, Inc., Reading, Pa.  
Wilson Co., Inc., Atchison, Kan.

#### Army Guidon Award

United States Spring & Bumper Co., Los Angeles.

#### National Security Award

Bethlehem Steel Co., Bethlehem, Pa.

# READY TO TACKLE YOUR PROBLEMS with OIL HYDRAULICS

You'll find the evidence all about you—oil hydraulics is moving rapidly into almost every phase of the industrial picture. It is setting a fast pace for new and improved ways of getting things done *better*. If you haven't already had occasion to note this trend, or to take advantage of it in your wartime production, your postwar planning will bring it sharply into focus.

The *reason why* hydraulic power is so much better for so many jobs is simple enough: oil under pressure can be applied to almost any power need to give *stepless* speed variation; *constant* speed control; shockproof starting, stopping and reversing; *direct* and *instant* control of power or movement; *uniform* power in any direction, in rotation, or in operating sequences; many other similar advantages.

Knowing *how* to apply oil under pressure to achieve the right combination of advantages for each job is not quite as simple. But Denison HydrOILic Engineers have solved so many new problems in this field—for so many different industries and over so many years—that they have reduced this important "know-how" to an almost exact science.

In making these technical advances, Denison has proved the advantage of *complete oil hydraulic service*, from expert analysis of individual requirements to installation and initial operation of the HydrOILic equipment that meets them.

You are invited to avail yourself of this specialized experience. No matter how vague or how concrete your immediate and postwar planning may be, now is the time to begin discussing HydrOILics in terms of your particular needs. Write today.

The DENISON Engineering Co.  
1158 Dublin Rd., Columbus 16, Ohio

## ANALYZING the PROBLEM



## DESIGNING the ANSWER



## BUILDING the EQUIPMENT



## INSTALLING the EQUIPMENT



HUNDREDS of production jobs and special operations are handled with HydrOILic Equipment—in wartime and peacetime industry alike. Among these tasks are assembling, straightening, broaching, conveying, extruding, crimping, loading, lifting, handling, hauling, hoisting, tilting, testing, turning, pushing, pulling, packing, pressing, indexing, rotating. Let Denison Engineers help you determine how, and HOW MUCH, HydrOILics can help you.

Industry's Right Hand



# DENISON

EQUIPMENT in APPLIED

# HydrOILics

# Fatigue Cracks . . .

BY A. H. DIX

## Underwear and Beer

I thought everyone knew that B.V.D. stands for "back vent drawers."

And wait until Ballentine's hear that you have credited the trade mark "P.O.N." to Kruegers Brewery instead of to Feigenspan's, which is now owned by Ballentines. Will your face be red!

—Clark C. Thompson, President,  
Foster Pump Works, Inc., Brooklyn, N. Y.

We are blushing clear down to our clavicle. For our ignorance of the fact that B.V.D. means "back vent drawers," we have no excuse. It is just one of those dropped stitches in the fabric of our education. But our failure to link P.O.N. and Feigenspan's brings up a subject dear to our heart—the waste involved in advertising a trade mark or slogan that the public fails to identify readily with the product.

A trade mark or slogan can bask in the limelight of great popularity without doing much to elevate its owner's stature. Sometimes the effulgence of the former actually casts a shadow on the man who is paying for the performance. He can beat the game by painting his name boldly on his performer's breast. Wherever P.O.N. goes, let Feigenspan go. "Feigenspan's P.O.N." is superior to "P.O.N." You might not recall who used the slogan, "Ask the Man Who Owns One," but you can never forget who says "When Better Cars Are Built Buick Will Build Them."

## Aptronym

• • • The chief draftsman of Continental Motors is Joe Sketch.

## Sports Note

• • • Time speaks of England's BBC chief, William John Haley, as being a cunning left-handed chess player.

We recall a night at the Southside Pawn, Rook and Chowder Club when Jake Foster brought the house down by playing two games right-handed and then switched over and played two left-handed, winning 'em all. Greatest thing we've ever seen since Iron Man McGinnity pitched a World Series double-header.

## Burma Road Map

• • • Of course, we could have saved Frank some trouble by marking the proof of the cut "This end up," but we never thought of it until just now. Which reminds us of what we were told by Major Chen, of the Chinese Army, who was one of our visitors at the Metal Show. The major, who is 44 and looks 21, just returned from China a few month ago.

He says that some manufacturers who ship goods to China could improve their shipping methods. Stencilling "This End Up," for example, on the end of a case means nothing after the shipment has reached China, for unlike the major practically none of the handlers there has had the benefit of an M. I. T. education and the English characters mean no more to them than a laundry check does to you.

Also, spare parts and instruction manuals should be packed in with the equipment itself, for China has a system of transportation priorities. The equipment itself is likely to get a "must" rating; spare parts usually come lower, and printed matter is last. "And," as the major said, "if we don't know how to operate the equipment, what good is it to us?"

## But Not With Palsy

• • • Our item on fast-dialed telephone numbers moves W. J. Martin, of Dahlgren, Va., to write that if you have a delicate touch you can, with practice, get a

number on a dial phone without using the dial. You click out the letters and digits on the receiver hook or button.

And as champion of the fast-dialed number division Edward W. Weiler offers General Electric Co. GE's New York number is WI-2-1311; Schenectady is even better—2211.

## Taps in Garret

• • • GE is asking its stockholders for advice on post-war household products. We have long since disposed of the ten shares we bought back in '34 as a hedge against the inflationary scare of the time, but we would like to play anyway. All we ask for is an attic light that will automatically shut itself off in a half hour.

## Watts in Your Fingers

• • • Which reminds us to mention that we would like to own one of those GE photoelectric recorders that measure delicate currents, as for instance the increase in your personal wattage when you are under emotional stress. Observe the gyrations of the needle as the young lady looks at a picture of her soldier boy friend.



The instrument is sensitive to the millionth of a millionth of a watt, which is fine enough to give us the answer to something that has always puzzled us—whether our

dislike for turnips exceeds our dislike for the Fitch shampoo radio theme song.

We wonder whether the instrument is sturdy enough to stand up under the strain of a great emotion, say for instance that of our friend William E. (Armco) McFee's when he encounters the abbreviation "ad," or our own when "magazine" is shortened to "mag."

## He Doesn't Know Which End Is Up

• • • Winner of our illegible signature sweepstakes is R. W. T. Ricker, of Harris D. McKinney, Philadelphia ad agency, whose entry is this:

The signature is that of Z. Z. Li, of the C. I. E. (Chinese Institute of Engineers) Journal. We don't begrudge Mr. Ricker his victory, but in fairness to the losers we must admit that Z. Z. Li is the kind of a name it is practically impossible to write legibly.

We are glad in a way that this is the last of the scrawls, as our art and make-up editor, Frank Winters, complained he could never tell which was top and which was bottom of the signature cuts, as if it made any difference.

## Puzzles

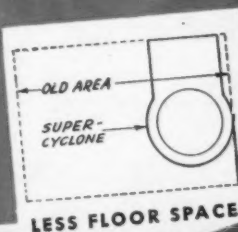
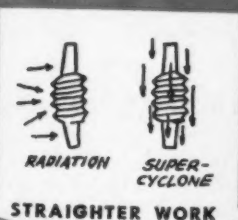
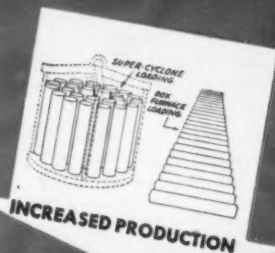
Last week's gamblers started with \$39, \$21, and \$12. Our thanks to Emil O. Schott, A. C. Wilcox, and Clark C. Thompson for sending us the fireman-brakeman-engineer problem.

It is a long time since we had a match trick. Our v.p. and g.m., Charles Samuel Baur, contributes this one:

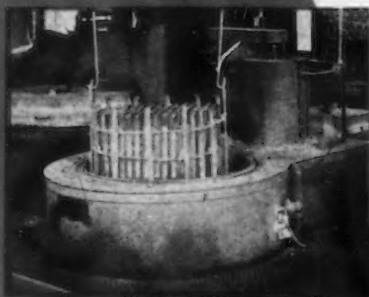
$VII = I$  Take seven matches and arrange them thus:

Now rearrange one of the matches and make the equation an honest one.

# You get these advantages with the **LINDBERG SUPER-CYCLONE**



Large loads are accurately heated and easily handled



The revolutionary idea of heating steel to 1750°F. with recirculated air is embodied in the Lindberg Super-Cyclone Furnace. This principle with its accuracy, rapid uniformity and close control of heating offers many advantages, a few of which are listed below.

## **INCREASED PRODUCTION**

The Super-Cyclone Furnace has increased production in the hardening of shells, rifle barrels, flanges, slip yokes, worm gears, bearing races, tank parts and hundreds of similar items. In some cases, production has increased *twelve times* over older methods of heat treating. Bulletin 130 shows how you can figure possible production increases on your own work.

## **STRAIGHTER WORK**

The Super-Cyclone's 100% forced convection heating principle heats the work rapidly and uniformly and eliminates the possibility of one-sided or radiant heat from striking the charge and causing distortion. Straightening time is eliminated or reduced to a minimum. Valuable man hours are released from the press for other work.

## **LESS FLOOR SPACE**

Based on averages of what the Super-Cyclone has done in other plants, you can figure that it will not occupy more than 1/3rd the floor area demanded by conventional equipment to handle the same or greatly increased production.

## **EXTRA MAN HOURS AVAILABLE**

The Super-Cyclone method of handling work on fixtures or in baskets, eliminates the individual handling of parts in heating and quenching. In many plants, lone operators handle large loads through successive steps of heat treatment, for example, forgings are normalized, hardened and tempered in the same Super-Cyclone without being removed from the fixture.

## **SPECIAL HEATING**

Because the Super-Cyclone can be heated at any desired rate to 1750°F. and cooled according to a definite schedule, it is well suited to stress relieving, cycle annealing, malleablizing, and other heating operations requiring a specific cycle. Write for the Super-Cyclone Bulletin 130.

**LINDBERG ENGINEERING COMPANY**  
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# **LINDBERG FURNACES**



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# Dear Editor:

## POWDERED METALS

Sir:

Will you kindly give me the names of some publishers who have books on powder metallurgy? I am primarily interested in securing a few books dealing with basic principles.

T/5 A. Z. CUTLER

4th P.O.T.C.,  
Aberdeen Proving Grounds,  
Md.

● We recommend "Principles of Powder Metallurgy", by W. D. Jones, issued by Longmans Green & Co., 55 Fifth Ave., New York, price \$5, published three or four years ago. For latest developments, see the numerous articles in The Iron Age on the subject.—Ed.

## RECIPROCATING DRILL

Sir:

Will you kindly give us the address of the people who make the reciprocating drill attachment described recently in THE IRON AGE. This is the drill that lifts slightly after each revolution, permitting an increase in drilling speed.

FRED GERSON

Akron Hardware Co.,  
36-52 37th Street,  
Long Island City 1, N. Y.

● The manufacturer of the Rego Karweit drill, described on pages 48-51 of the June 17, 1943 Iron Age, is Bastian-Blessing Co., 4201 West Peterson Ave., Chicago 30.—Ed.

## QUEENY'S "ENTERPRISE"

Sir:

Please forward one copy of the "Spirit of Enterprise," by Edgar M. Queeny. An editorial concerning it appeared in your July 29 issue. Send invoice in triplicate.

MILDRED E. McDONALD,  
Librarian

Westinghouse Elec. & Mfg. Co.,  
East Pittsburgh, Pa.

● The publisher of this book is Scribner's, 597 Fifth Ave., New York, to which your letter is being sent.—Ed.

## PORCH CLIMBING

Sir:

A recent editorial in THE IRON AGE, by J. H. Van Deventer, entitled "Modern Porch Climbing," intrigues me. I should like to know if reprints are available and the cost of 50.

DUDLEY B. POLING, Manager  
Banner Die, Tool & Stamping Co.,  
1027 W. Fifth Avenue,  
Columbus, Ohio

● Paper rationing has made it difficult for us to supply reprints. However, small quantities can usually be made economically by offset reproduction. Fifty copies of the Sept. 16 editorial can be had for \$2 or \$3.—Ed.

## CHINESE LIBRARY COPIES

Sir:

In a recent issue, I saw a plea for back copies of THE IRON AGE to be sent to China for the use of libraries there, but neglected to get the address

of the person to whom they should be sent.

C. S. STOUT, Sec'y

Marshall Furnace Co.,  
Marshall, Mich.

● Copies for the National Geological Survey of China should be sent to Miss Dorothy J. Comins, Executive Asst. to the Committee on Aid to Libraries in War Areas, Library of Congress Annex, Study 251, Washington 25, D. C.—Ed.

## POSTWAR INDUSTRIAL MARKETS

Sir:

We are conducting a study for an industrial client who desires to manufacture industrial machinery and equipment. We realize there are many new developments affecting all industries, which will have a tremendous bearing on post war markets.

Any material or articles you have, which may be of interest, will be greatly appreciated.

DONALD C. FULLER

Day & Zimmermann, Inc.,  
Packard Bldg.,  
Philadelphia 2

● One of the best of the innumerable articles on postwar markets is that by Francis J. Juraschek, page 82 of The Iron Age issue of June 10. Another good article was prepared by the U. S. Steel Export Co., 30 Church St., New York. A copy of this report can be obtained, we believe, upon direct request.—Ed.

## BARCOL IMPRESSOR

Sir:

Your Oct. 14 News Front refers to the Barcol Impressor, a light weight, portable hardness tester. We would like complete information.

H. MAHN, President

Band-It Co., Inc.,  
2536 Walnut Street,  
Denver 5

● See "Hardness Testing With the Barcol Impressor," pages 84-88, Oct. 14 Iron Age. For further information, write to the manufacturer, Barber-Colman Co., Rockford, Ill.—Ed.

## BOUQUET

Sir:

The two-part article, "Screw Machine Steels," in your Sept. 16 and 23 issues, by A. S. Jameson, is excellent. I wish to extend my congratulations to the author on this fine piece of work.

Since the introductory remark at the top of the first article indicated that the work would be published in two parts, some of the material has evidently been omitted, as none of the tables mentioned in the second part were included. Will these be published at a later date?

H. H. LURIE, Chief Metallurgist  
Cummins Engine Co.,  
Columbus, Ind.

● See page 69 of the Oct. 28 issue for the missing tables.—Ed.

## TOOL DISPLAY BOARD

Sir:

Your Oct. 14 issue, page 73, shows a "tool display board." The typewrit-

ten information below the drills is too small to be clear. Could you send me information that would clarify the details illustrated on this board?

W. J. LOEFFLER

Pleasantview Drive,  
Greenville, R. I.

● A letter to Hendley N. Blackman, News Bureau, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., should bring the desired information.—Ed.

## DE-OXIDIZER SITUATION

Sir:

Because of the scarcity of regular de-oxidizers for steel and other metals, our South American friends inquire for some reliable substitute which is not on the critical list. We would appreciate your giving us any available information on the subject.

AMERLUX STEEL PROD. CORP.  
551 Fifth Avenue,  
New York

● The situation has eased considerably over the past few months, and we believe not too much difficulty will be encountered now in getting such products as ferro-silicon, ferro-manganese, calcium-silicon and silico-manganese.—Ed.

## SURFACE BUBBLES IN H. S. S.

Sir:

We are interested in an article on surface bubbles in high speed steel by J. G. Morrison of Landis Machine Co. This article appeared in your magazine about three years ago. Can you tell us when?

R. K. WARREN, Metallurgist  
Crucible Steel Co. of America,  
Syracuse, N. Y.

● See page 29 of the April 27, 1939 Iron Age, and page 40 of the May 4, 1939 issue.—Ed.

## COMPARABLE ELECTRODES

Sir:

We have an air mail request from the Chief Quartermaster on the Canal Zone for nine copies of "Comparable Arc Welding Electrodes," printed in your May 13 issue. Can you supply them?

B. F. BURDICK,  
Gen'l Purch. Officer  
Panama Canal Purchasing Dept.,  
Washington 25, D. C.

● The heavy demand for this four-page table exhausted our supply of the May 13 issue. We reprinted the tables but have run out of copies. A second reprint is now on the press.—Ed.

## CUTTING TOOL BOOKLET

Sir:

Your booklet, "How to Get Maximum Output from your Cutting Tools," contains information applicable to an investigation now in progress. The factory would appreciate a copy of the booklet.

KARL H. WHITE,  
Chief Draftsman  
U. S. Navy Yard,  
Naval Aircraft Factory,  
Philadelphia

● The booklet (price 60c) is a reprint of latest reports on cutting tool conservation methods as published in The Iron Age. A copy of the booklet is being sent, but be sure to see recent issues of The Iron Age for articles too current to appear in the booklet.—Ed.

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Produced by patented  
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dense, less porous product

(\*U. S. PATENT NO. 2,187,660)

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*Canton, Ohio*

Chicago

Detroit

Pittsburgh

Tacoma

# This Industrial Week . . .

- **Fourth Coal Strike Threatens Steel**
- **CIO Organizing White Collar Workers**
- **Electric Furnace Slack Being Taken Up**
- **Alloy Conservation Plan Proposed**

**A**S the fourth national coal mine strike in six months got under way, the iron and steel industry at the start of this week faced its darkest days since the war began. The need for conserving slender coal reserves was expected to force furnaces on to slow draft and eventually to impair the fast tempo of all major departments. Even if the miners return fairly promptly, the effects of the disruption will be felt for a long time in the steel industry.

**I**F doubt existed as to the 1943 happening most detrimental to the war effort, the drawn-out crisis at the mines appeared likely to clinch the title when the latest national stoppage began. Ingot production schedules which were figured on Monday this week were purely tentative.

Because of the record high operating rate that the steel industry has maintained, production lost on account of the strike cannot be retrieved. Translated into war equipment or civilian goods, the iron and steel lost during the six months in which the mine problem has gone from bad to worse equals a tremendous amount. In addition to the four general walkouts, coal production has suffered through innumerable wildcat strikes, slowdowns, manpower shortages and a falling off in tons per man-day efficiency.

Although ten-day supplies of coal are held by large steel producers in the East, the giant Clairton by-product works near Pittsburgh holds less than a week's supply and Southern centers hit by a wave of outlaw mine strikes which started in mid-October, have very low stocks.

Seven open hearths and nine blast furnaces were idle in the South at the start of this week. The Chicago area appeared to be slightly better stocked than other districts. Over the nation, beehive coke ovens were being sealed simultaneously with the start of the miners' walkout. Beehive production for 1943 has been running four per cent behind 1942.

**T**HE pattern of the current general strike was similar to its predecessors this year. The steel industry on Monday was confused, since the situation had not reached the point where exact operational

## Roosevelt Names "Kitchen Cabinet"

**WASHINGTON** — President Roosevelt has appointed belatedly a "kitchen cabinet" of business men. Those who are in the cabinet and who met Oct. 27 are:

F. C. Crawford, president of the National Association of Manufacturers; K. T. Norris, president of the Norris Stamping Co.; Eric Johnston, United States Chamber of Commerce president; Benjamin F. Fairless, president of the United States Steel Corp.; Richard R. Dupre, president of Procter and Gamble; George H. Mead, president of the Mead Corp.; David Sarnoff, president of the Radio Corp. of America; and Cason Calloway, southern textile manufacturer.

A second meeting is scheduled for Nov. 22. The business group will advise the President on war production, and such demobilization problems as conversion, contract termination, manpower and distribution.

plans could be made. If the shutdown lasted until mid-week, a 50 per cent cut in operations of certain plants was likely. First, pig iron and coke operations would be affected, followed by a decline in steel output.

An Oct. 31 contract renewal date long has been desired by John Lewis (who has been at odds with President Roosevelt since 1937) to replace the Spring expiration date.

The trouble at the mines wasn't the only labor situation confronting the steel industry this week. Quietly, the problem of the white collar worker has been coming to the fore, guided deftly by the CIO steel union. Salaried representatives from the Gary sheet and tin plate works, the Youngstown, Farrell, Clairton, Homestead and Edgar Thomson plants of Carnegie-Illinois Steel Corp. already have met with management and are in the final stages of negotiating a master contract, a preliminary copy of which has been in the hands of both parties for two weeks. This contract covers white collar workers.

Production losses in the steel industry such as are threatened by the coal mine walkout will heighten several tight situations such as that which has prevailed in sheet steel and plates.

**I**N order to release urgently needed open hearth capacity for carbon steel production WPB last week directed that hereafter seven specified types of alloy steel are to be produced only in electric furnaces, except where unusual circumstances permit otherwise. The types of alloy steel are: All airborne aircraft steel where aircraft quality is specified; all airborne aircraft tubing; all armor piercing shot body and cap steel,

## News Highlights in This Issue

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20 mm. and larger; steel for integral parts of certain rifles and machine guns, excluding mounts and tripods; all steel for integral parts of guns, cannons, rifles and howitzers, 20 mm. and larger, excluding mounts and carriages; all bearing steel, including carburizing grades; all gear steel, excluding gears made from plate.

The shifting of alloy steel from open hearth to electric furnaces has materially helped delivery schedules of carbon steel. However, those familiar with steel scheduling are warning that customers should not take too optimistic a view of the possible effects of the switches.

While most of the 27 electrolytic tin plate lines which the steel industry has built are now capable of operation, orders haven't been available to keep all the new installations running. During the latter part of this year it is expected that electrolytic shipments will constitute about 15 per cent of total tin plate purchases. Next year, possibly one-third of the tin plate made for sale will be electrolytic.

Concern is being shown over the wastage of alloy materials in the open hearth and electric furnaces of the steel industry. Definite proposals to solve the problem are beginning to crystallize. The annual loss of nickel, chrome and molybdenum alone is estimated at 3,900,000 lb. The loss is attributed to the mixture of alloy scrap with carbon scrap and the necessity of diluting charges with carbon scrap to bring steels within required specifications.

Previously covered by the General Maximum Price Regulation, an important group of steelmaking alloying metals effective Nov. 8 will come under specific ceilings. Tungsten, molybdenum, vanadium, cobalt, and other items are included.

THE tentative estimate of national steel ingot production this week is 99.0 per cent of capacity, down half a point from last week. Pittsburgh operations are down three and a half points to 100 per cent and Chicago output is off a half point to 100.5 per cent. Other declines this week are: Philadelphia, down half a point to 93.5; Buffalo, down two points to 104.5; Birmingham, down two and a half to

# One-Third of Terminated War Contracts Settled

Washington

... Data gathered by the Sub-Committee on War Contract Termination of the Senate Military Affairs Committee indicates that approximately one-third of the amount of claims from terminated contracts presented to the leading military agencies has been paid to contractors. The figures are as follows:

Agency	Value of Claims	Payments
	Presented	on Settled Terminations
War	\$113,000,000	\$30,000,000
Navy	Not available	4,320,000
Maritime Commission	1,157,500	*991,358
Treasury Dept.-Lend Lease	180,982	160,486
Metals Reserve Corp.	0	0
Defense Supplies Corp.	163,356	84,282
Defense Plant Corp.	4,395,710	Not available

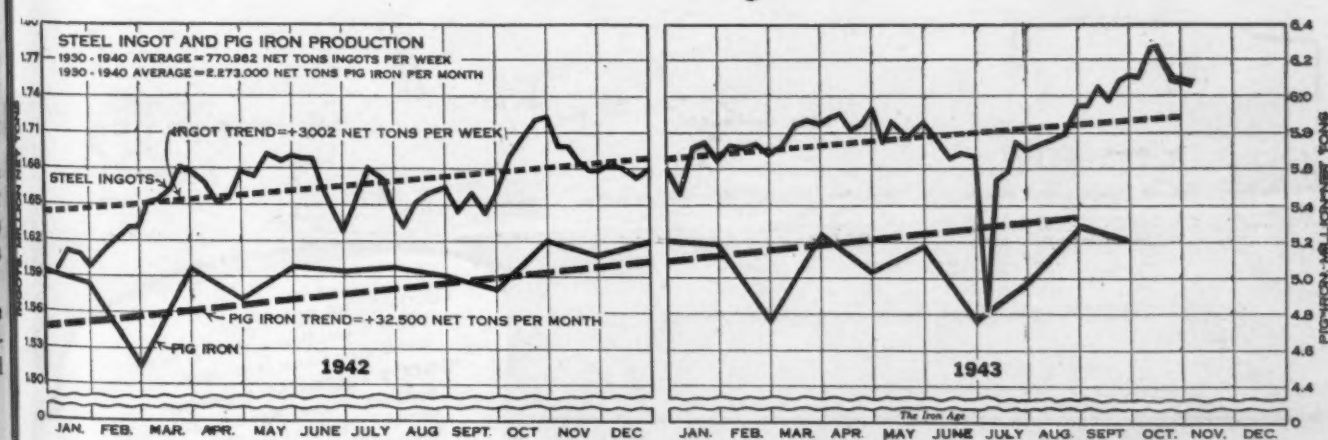
Total ..... \$118,897,628 \$35,556,126  
\*Not including Higgins Corp. Represents the value of claims settled, not necessarily the same amount of payments.

This information was compiled by the staff of the Sub-Committee on War Contract Termination from various official letters covering varied periods generally believed ending in August and September. Information available for activities outside Washington are incomplete, but it is estimated that such activities accounted for about 800 terminations having an average original value of \$40,000 and that about 90 per cent of the cases were settled without liability by the government. For other news of the termination question see page 100 in this issue.

92 per cent, and the Eastern district down eight and a half to 93 per cent. Contrary to this week's trend are the gains in Youngstown up three points to 100 per cent; Wheeling up half a point to 102.5; Detroit up half a point to 104.5, and Cincinnati up two points to 98 per cent. Unchanged from last week are Cleveland at 96.5 and St. Louis at 106.5 per cent.

Correction: In the third paragraph from the end of the special story on alloy steel which appeared on this page last week, a typographical error appeared. The figure 95,000 should have been 955,000.

## The Iron Age



Steel Ingot Production by Districts and Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
October 28	103.5	101.0	97.0	94.0	96.5	106.5	102.0	94.5	104.0	95.0	96.0	106.5	101.5	99.5
November 4	100.0	100.5	100.0	93.5	96.5	104.5	102.5	92.0	104.5	95.0	98.0	106.5	93.0	99.0

*All over the World-*

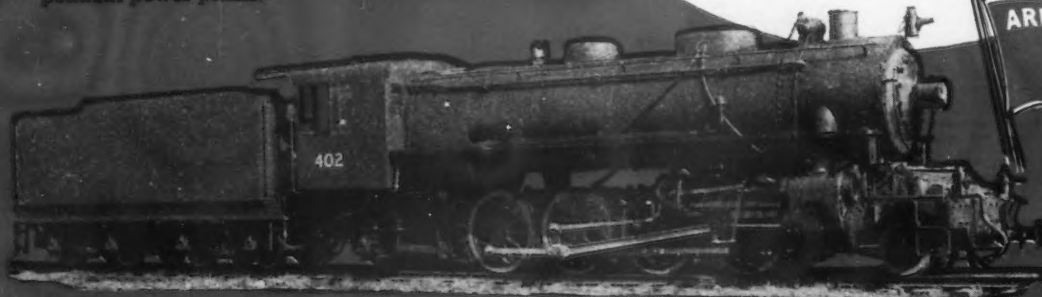
# PORTER LOCOMOTIVES



PORTER 0-6-0 50-Ton Steam Locomotive with side tanks, widely used for military and industrial switching.



PORTER Diesel-Electric powered by two independent power plants.



PORTER 2-8-2 "Mikado" Type Steam Locomotive for long road hauls.

**H. K. PORTER COMPANY, Inc.**

PITTSBURGH, PENNSYLVANIA

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In every theatre of the war, Porter Locomotives are to be found, somewhere behind the lines, keeping the everlasting stream of supplies rolling toward the fighting front.



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**PORTER**  
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### QUIMBY PUMP DIVISION:

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### ORDNANCE DIVISION:

Projectiles, Heavy Forgings, Breech Blocks.

# Want New Ideas? Try Patents Seized By U.S. Government

## Iron Age Prints Another Helpful List of Them

• • • Talk about new ideas, new products, new markets, post-war employment! The patents seized by the United States Government from the inventors of enemy nations and enemy-occupied countries offer wide possibilities in numerous fields for interested firms, small or large.

Over 50,000 patents have been thrown on the open market, so to speak, since the war began. Deprived of the protection they had enjoyed, the ideas of the foreign inventors became "fair game" for U. S. firms, any number of which may use the same alien patent.

On July 8 this magazine in its news section printed a representative cross-section of seized patent applications in the metalworking field. A descriptive article was printed May 13. To give readers a better idea of what the Alien Property Custodian has to offer, some of the actual patents believed open for licensing are listed in this issue, below.

Obviously, it is difficult to reduce a lengthy patent description to a few words, and the accuracy of the items listed cannot be guaranteed, but at least an idea of what each pertains to will be found.

The seized patents are grouped in classes. In the list below, the sub-class number is given at the start of the item in parenthesis, followed by the patent number, description of the patent, the inventors name and his nation, and the date the patent was granted.

### Example:

(65) 1,949,021. Device for casting by centrifugal force comprising a rotatable support and a mold mounted on said support. Joseph Leuser, Germany. 2-27-34.

Libraries of seized patents are maintained at the Alien Property Custodian's office on South La Salle Street, Chicago, and at the Alien Property Custodian's office at 120 Broadway, New York.

Here's how you get a license under a patent owned by the Alien Property Custodian:

1. Write to the Office of Alien Property Custodian, Chicago 3, Ill., for an index of the catalog lists of vested patents and specify the Patent Office classification or the particular field of patents or patent applications in which you are interested. Individual sections of classes will be furnished for 10c. each, except for Patent Office Class Nos. 23, 74, 88, 95, 123, 178, 179, 250 and 260, which are 25c. each. The complete catalog is \$5.00, without binders.

2. Examine catalog to select individual patents or patent applications of interest. If you desire

### Heavy Orders for Flat Rolled Steel May Force Excess Bookings But WFB Says Firms Are Hesitant

Washington, D. C. (AP) — The War Relocation Authority (WRA) today announced that it has received orders for flat rolled steel from Japan and Germany. The orders are for a total of 1,000,000 tons of steel, which is a significant increase over the previous year. The WRA is currently negotiating with the Japanese and German governments to secure the steel, but it is also aware of the potential for excess bookings. The WRA is currently negotiating with the Japanese and German governments to secure the steel, but it is also aware of the potential for excess bookings.

### Future of New Steel Plant in West Dependent Upon Period of Adjustment, Say Observers in Utah

Salt Lake City, Utah (AP) — The future of a new steel plant in the West is dependent upon the period of adjustment, say observers in Utah. The plant, which is being built by the Utah Steel Company, is expected to be completed by the end of the year. The plant is being built in a remote area of the state, and its success will depend on the ability of the company to attract investment and secure a market for its products.

### Loss CMP Allowance For Farm Implements Seen Threatening 1944 Food Crop Harvesting

Washington, D. C. (AP) — The loss of a CMP allowance for farm implements is seen as a threat to the 1944 food crop harvesting. The CMP allowance is a government program that provides farmers with financial assistance to purchase new farm equipment. The loss of this allowance would significantly reduce the number of farmers who are able to purchase new equipment, which would in turn reduce the overall food crop harvest.

### WFB Counting upon

Washington, D. C. (AP) — The War Relocation Authority (WRA) is counting upon the cooperation of the Japanese and German governments to secure the steel orders. The WRA is currently negotiating with the Japanese and German governments to secure the steel, but it is also aware of the potential for excess bookings. The WRA is currently negotiating with the Japanese and German governments to secure the steel, but it is also aware of the potential for excess bookings.

### U.S. War Production Patterns in Be Kept On Its Course Despite Italy's Fallop

Washington, D. C. (AP) — The U.S. War Production Administration (WPA) today announced that it will keep its production patterns on their current course despite the recent setbacks in Italy. The WPA is currently producing a large number of war-related products, and it is confident that it will be able to maintain its production levels even in the face of these setbacks.

### Sharp Rise in Labor Turnover in WMC Refractories and Red Tapes; No One Wants to Be Common Laborer

Washington, D. C. (AP) — There has been a sharp rise in labor turnover in the WMC Refractories and Red Tapes industry. The industry is currently experiencing a shortage of workers, and many of the workers who are leaving are doing so because they do not want to be common laborers. The industry is currently experiencing a shortage of workers, and many of the workers who are leaving are doing so because they do not want to be common laborers.

### Steepest Ascent of Plane Industry: U.S. Output Already Exceeds Axis

Washington, D. C. (AP) — The aircraft industry in the United States is experiencing its steepest ascent yet. U.S. output of aircraft has already exceeded that of the Axis powers. The industry is currently producing a large number of new aircraft, and it is expected that production will continue to increase in the coming months.

### Scramble for Peace-Time Jobs Reported

Washington, D. C. (AP) — A scramble for peace-time jobs is being reported in the United States. Many workers who have been employed in the war-related industry are now looking for new jobs in the civilian sector. The government is currently working to help these workers find new jobs, but it is also aware of the potential for a shortage of workers in the civilian sector.

### Massive Investment in Plants Gives Government Great Power, but Jones Predicts a Fair Deal

Washington, D. C. (AP) — The massive investment in plants by the government has given it great power, but Jones predicts a fair deal. The government is currently investing a large amount of money in new plants, and it is expected that this investment will give the government a significant amount of power. Jones, however, predicts that the government will be able to secure a fair deal for the workers in these plants.

### Labor and Management Plunge into Campaign for More Steel at Railroads in Chicago and Pittsburgh

Chicago, Ill. (AP) — Labor and management have plunged into a campaign for more steel at the railroads in Chicago and Pittsburgh. The campaign is being led by the United Brotherhood of Carpenters and Joiners of America, which is currently negotiating with the railroads for a new contract. The campaign is being led by the United Brotherhood of Carpenters and Joiners of America, which is currently negotiating with the railroads for a new contract.

### Expansion Facts in Steel Have Shortened The War, Batcheller Says in Revealing Complete Figures as of May 1

Washington, D. C. (AP) — Expansion facts in the steel industry have shortened the war, according to Batcheller. Batcheller, who is a leading expert on the steel industry, has released a report that shows that the expansion of the steel industry has had a significant impact on the war effort. The report shows that the steel industry has produced a large number of new products, which have been used in a variety of ways to support the war effort.

### Management Analyzes Problems in Ranks of Foremen: Prompt Action Held Necessary

Washington, D. C. (AP) — Management has analyzed the problems in the ranks of foremen, and prompt action is held necessary. The management is currently working to identify the problems that are causing issues in the ranks of foremen, and it is expected that prompt action will be taken to address these issues. The management is currently working to identify the problems that are causing issues in the ranks of foremen, and it is expected that prompt action will be taken to address these issues.

### Steel Industry Under New Pressure To Produce 1,000,000 More Tons Of Ingots for Third Quarter

Washington, D. C. (AP) — The steel industry is under new pressure to produce 1,000,000 more tons of ingots for the third quarter. The government is currently working to increase the production of steel, and it is expected that the steel industry will be able to meet this target. The government is currently working to increase the production of steel, and it is expected that the steel industry will be able to meet this target.

### Advises on the Home Front

Washington, D. C. (AP) — The government is providing advice on the home front to help citizens support the war effort. The advice includes tips on how to conserve resources, how to help with the war effort, and how to stay safe. The government is providing advice on the home front to help citizens support the war effort. The advice includes tips on how to conserve resources, how to help with the war effort, and how to stay safe.

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printed copies of a patent or copies of the specifications and drawings of any vested application, these may be secured for 10c. each from the Commissioner of Patents, Washington 25, D. C. Orders should be accompanied by currency, certified check, money order, or Patent Office coupon.

3. Write to the Office of Alien Property Custodian, Chicago 3, Ill., if you desire technical consultation or special information.

4. When you decide on the patent or patent application under which you wish a license, address your letter of application to the Office of Alien Property Custodian, Washington 25, D. C. To prevent delay in issuing licenses, your letter of application should include the information outlined below.

5. With your letter, enclose a license fee of \$15 for each patent or patent application under which you wish a license. Remittance should be made by certified check, bank draft or money order, payable to "Alien Property Custodian." Your money will be refunded if the license is not granted.

Here are instructions and suggestions for preparing a letter of application for a license. In applying for a license to use a vested patent or patent application, you should furnish the Alien Property Custodian with the following information:

1. (a) Your name and business address; (b) Legal form of business (corporation, partnership, sole proprietorship, etc.); (c) If a corporation, the state in which incorporated; (d) Trade name, if used by either a partnership or proprietorship; (e) Nature of the business, such as manufacturer, distributor, retailer, etc. (specify principal lines handled); (f) Name, citizenship, and legal residence of the corporate officers and directors, or of the partners, or of the proprietor, as the case may be; (g) If a corporation, the approximate percentage of voting stock owned by or for the benefit of non-citizens of the United States, or the percentage of shares subject to withholding tax on dividends to non-resident aliens; (h) Classification of your business according to net worth, e. g. *Small* (Under \$125,000), *Medium* (Between \$125,000 and \$1,000,000), *Large* (Over \$1,000,000).

2. A list of the specific patents or patent applications under which you seek a license, as well as the purpose or purposes for which the license is desired; e. g. (a) War production; (b) Present production but not directly for war; (c) Future or post-war production; (d) Research or further

• • • Millions of words have been spewed out in recent months on the currently-fancied subject of post-war planning. Boiled down, very little of practical value for industries remains from the mass of words. Here, in the patents seized by the government, are specific tips for large and small firms alike, which seem to offer wide possibilities.

development; (e) Protection from possible infringement of the patents for which the license is requested; and (f) Other reasons (Please explain in detail).

3. A statement as to whether you have existing rights for the use of any of the patents specified in your application.

Send your letter of application to the Office of Alien Property Custodian, Washington 25, D. C., enclosing a license fee of \$15 for each patent included in your application. Correspondence in regard to licensing negotiations may be handled directly by the applicant, or by his designated attorney, if a power of attorney accompanies the letter of application.

#### Class 205—Metal Drawing

- (3) 2,054,770. Apparatus for making conical tubular bodies. Fritz Gross, Germany. 9-15-36.
- (4) 1,879,743. Guide for the mandrel shafts in

**VERSATILE SHIPBUILDER:** Andrew J. Higgins, New Orleans shipbuilder, is shown here with his latest invention — the Ushakoff still, designed to save the lives of aviators and shipwrecked mariners.



- tube drawing benches. Heinrich Heetkamp, Germany. 9-27-32.
- (4) 1,959,425. Draw bench for the manufacture of seamless tubes or tubular bodies. Heinrich Heetkamp, Germany. 5-22-34.
- (4) 2,024,185. Push bench used in production and further working up of tubes and hollow bodies. Ewald Rober, Germany. 12-17-35.
- (4) 2,024,186. Drawing bench for producing tubes or hollow bodies in which the drawing is performed by a push bar which operates the mandrel. Ewald Rober, Germany. 12-17-35.
- (4) 2,096,243. Tube pushing bench. Heinrich Heetkamp, Germany. 10-19-37.
- (4) 2,140,633. Means for driving tube drawing benches. Fritz Kocks, Germany. 12-20-38.
- (4) 2,219,995. Means of adjusting the guide elements on the draw bench in a tube drawing machine. Heinrich Heetkamp, Germany. 10-29-40.
- (4) 2,234,863. Process and apparatus for expanding tubes. Heinrich Heetkamp, Germany. 3-11-41.
- (7) 1,767,845. Construction of apparatus for drawing hollow blanks whereby the mandrel is supported when withdrawn from the drawing dies. Heinrich Heetkamp, Germany. 6-24-30.
- (7) 1,886,935. Press for drawing hollow bodies. Karl Bohle, Germany. 11-8-32.
- (7) 1,889,314. Tube drawing bench. Heinrich Heetkamp, Germany. 11-29-32.
- (7) 1,889,320. Push bench mandrel guide. Mathias Peters, Germany. 11-29-32.
- (7) 2,190,889. Drawbench with a chain running in a horizontal plane round a frame formed in the shape of a I — (double T). Max Schunck, Germany. 2-20-40.
- (8) 1,952,560. Drawing process for the production of brilliant polish round steel rods. Heinrich Moller, Germany. 3-27-34.
- (8) 1,985,833. Method for the production of helical longitudinal grooves on the outer surface of cylindrical tubes. Hugo Lampart, Germany. 12-25-34.
- (8) 2,198,149. Method of production of pipe conduits for chemical purposes. Heinrich Bangert, Germany. 4-23-40.
- (9) 2,017,397. Method and apparatus for welding tubes. Heinrich Esser, Germany. 10-15-35.
- (14) 1,693,224. Multiple wire drawing machine for drawing fine wires from suitable materials. Peter Darmstadt, Germany. 11-27-28.
- (14) 1,907,311. Wire drawing machine of the multi-wire drawing type. Valentin Weil and Hermann Gutmann, Germany. 5-2-33.
- (14) 1,914,833. Multiple wire drawing machine. Walther Nacken, Germany. 6-20-33.
- (14) 1,976,247. Wire drawing machine. Wilhelm Rohn, Germany. 10-9-34.
- (14) 1,999,942. Multiple wire drawing machine, the drawing rolls of which are carried by vertical shafts passing through the bottom of the receptacle containing the drawing solution and rotated by a stationary gear disposed in the machine frame. Walther Nacken, Germany. 4-30-35.
- (14) 2,062,723. Multiple wire drawing machine. Walther Nacken, Germany. 12-1-36.
- (14) 2,127,306. Wire drawing machine of the plural type. Walther Nacken, Germany. 8-16-38.
- (19) 1,861,563. Multiple drawing bench used in the manufacture of metal wire. Johannes Diehl, Germany. 6-7-32.
- (20) 1,648,814. Wire drawing machine. Alfred Kreidler, Germany. 11-8-27.
- (20) 1,688,159. Drawing ring for wire drawing machines. Peter Darmstadt, Wilhelm Stegmann and Valentin Weil, Germany. 10-16-28.
- (21) 1,924,839. Method and machinery for drawing wire. Johannes Friedrich, Germany. 8-29-33.
- (21) 1,949,599. Process for drawing, rolling or pressing metal such as iron and steel in the manufacture of tubes, wire, sheet, etc. Nikolaus Bregger, Austria. 3-6-34.
- (21) 2,258,930. Process of cold metal drawing. Rudolf Haefner, Max Schunck, Germany. 10-14-41.
- (22) 1,874,992. Device for guiding the man-

(Continued on Page 148)

## CIO Launches Big Drive for White Collar Workers in Steel Industry

By TOM CAMPBELL  
Pittsburgh Editor

### Pittsburgh

• • • While Phil Murray's United Steel Workers' Union is poised to go after higher steel wages, if the coal miners get theirs, the drive to bring white collar workers into the steel union is gaining momentum. This move has all the earmarks of an industry-wide program to put salaried workers under contract.

Lodges of salaried workers in the steel industry are not unheard of. Several have functioned for years. Generally they have been small potatoes compared to what has been projected in Pittsburgh recently. Salaried representatives from the Gary sheet and tinplate works, the Youngstown, Farrell, Clairton, Homestead and Edgar Thomson plants of the Carnegie-Illinois Steel Corp. have met with management and are in the final stages of negotiating a master contract for white collar workers in the company. Both sides have been studying the tentative master contract. While this contract will be signed only by those plants which have had elections or whose salaried workers have been certified in favor of the union, the machinery is there for new lodges as they are formed. Elections which have been held already in the Carnegie-Illinois company have been overwhelmingly in favor of the USWA. Probably it will not be long before practically all white collar workers in the Carnegie-Illinois plants will have their contracts.

Other U. S. steel companies which already have white collar contracts in some or all of the plants are: Tennessee Coal, Iron & Railroad Co., Columbia Steel Co., America Steel & Wire, National Tube Co., and Oliver Mining Co. Negotiations preceding the signing of those contracts are believed to have lacked the significance and fireworks of those which preceded the drafting of the master contract at Carnegie-Illinois.

Observers who watched the progress of the USWA in organizing steel wage earners see clear signs that once again U. S. Steel subsidiaries have been picked for the initial ground work in organizing salaried employees. It is clear that when this movement has reached greater proportions, organization work will be

intensified at all other steel companies.

During the recent negotiations at Carnegie, such things as seniority, grievance machinery, inequality of salaries, the 48-hr. week and overtime, took the forefront in discussions. The USWA salary worker lodges are open to all salaried workers except those in confidential work and those who are classified as supervisors. It is significant that the membership in many of the Carnegie-Illinois plants is not only large, but includes employees who by no means can be classified as "small fry." Probably, the most important feature of the negotiations centered around the setting up of grievance machinery, in contrast with the former method of taking care of grievance through employees' supervisors, which usually was the last practical avenue. The wage earners' union has always signified a willingness to go to bat for the white collar workers, but this had been more of a gesture than reality.

The reasons for the white collared union move gaining substantial ground recently are not hard to find. Average monthly "take-home" pay for those on salary in the steel industry, in July of this year, was only 5 per cent higher than the average for the first six months of 1941. Contrasted to this, was a 43 per cent increase in the monthly "take-home" pay of the average wage earner. While it is true that the 5 per cent figure for the salaried people may be qualified by the fact that the lower brackets have received increases at

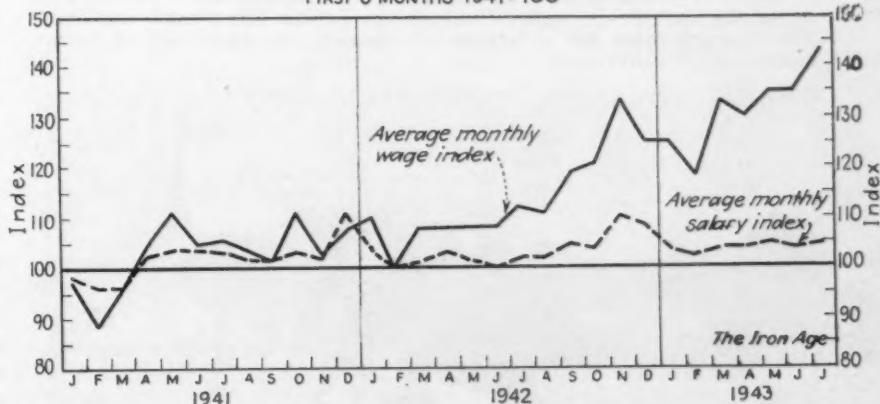
• • • Hourly wage rate changes in recent years in the steel industry were as follows: In March, 1941, the hourly rate for common labor or the "base" rate was 62½c. an hour; on April 1, 1941, it became 72½c. an hour; in August, 1942, it was set at 78c. an hour, and made retroactive to February, 1942.

At each of these times salary people had some sort of adjustment which was not applicable to some of the higher brackets. In April, 1941, at the discretion of the department heads a flat \$17 a month increase in salary was granted. In August, 1942, salaries were increased ranging from 10 per cent down to 5 per cent depending on the monthly pay. Those receiving more than \$7500 a year were not granted a raise in most companies.

the same time wage earners have been raised, apparently the salaried workers, both high and low, have not shared in the increased earnings of steel workers as a whole. Furthermore, the WLB freezing action has made it extremely difficult to get merit raises through in many cases.

Other factors which have brought about the white collared lodges are: Inability of most salaried workers to work overtime (or if they do, to get paid for it), the fancied or real inequality between the payments made to people doing the same type of work, the placing of salaried workers on reduced working time during periods of depression, which puts them close to the wage earning category, and the advantage taken by a few executives in using the salary payments to make up for increased advantages to wage earners.

TRENDS IN ACTUAL WAGE AND SALARY  
PAYMENTS IN THE STEEL INDUSTRY  
FIRST 6 MONTHS 1941=100



NOTE: 6 months 1941 monthly average wage = \$156.20; Average salary = \$251.20  
All amounts include wage incentives and overtime

wage earners, negotiations, grievances, etc., would have been extremely difficult to reconcile with problems in the steel industry. Being about seven years old, it is conceded by steel officials that the USWA probably knows more about the steel industry and its trouble than any other union could hope to know.

When white collar workers have been fully organized, steel management will then have to recognize the fact that when wage earners' rates are advanced, simultaneous attention will have to be given to salaries. An avalanche of grievances, fancied or otherwise, will be another load upon the shoulders of steel management. Thus, the latter are destined to become, whether they want to or not, not only steel makers, but industrial relation giants as well. This, of course, refers to top management, which in the last analysis must make the decision on wage and salary questions.

Turning to the wage earner's situation, while it is true that the "take-home" pay of hourly workers has advanced about 43 per cent over the average month in the first half of 1941, the War Labor Board has consistently refused to recognize total

wage payments in arriving at a wage decision. The WLB considers the average hourly rate. On that basis, Phil Murray's union will have three strikes against the steel industry if the "Little Steel" Formula is upset by the coal mine wage controversy. Even though the USWA has been holding its horses in order to give President Roosevelt a chance to come through with his promise of reducing the cost of living, an hourly wage increase to the mine workers, regardless of what form it takes, definitely will set off a demand for higher steel hourly rates.

Meanwhile, the steel industry finds itself hemmed in between OPA, steel ceiling prices, and an increasingly higher average wage rate paid per hour. The OPA and the WLB, judging from past performance, have not, and probably will not shed many tears over the fact that the ceiling over steel prices represented a level which was somewhat lower than steel prices in other periods, and which today sees the average wage rate paid at its highest point in the steel industry. For instance: In January, 1941, the average wage rate paid by the steel industry was 86.6c. an hour. By July, 1943, due to higher hourly rates, as

well as tonnage bonuses and overtime, this rate had climbed to \$1.15½ an hour; an increase of 34 per cent. More significant, however, is that the average wage rate paid per hour in January, 1941, was itself 33 per cent greater than was paid in 1936. This means that the average wage rate (which is made up by taking all wages paid whether it be the rate per hour or a combination of the rate per hour plus incentive pay plus overtime) has gone up about 77 per cent since January, 1936.

The only reason steel companies have been able to absorb such an increase has been due to a high volume of business and steady operation at an unprecedented level. What is causing sleepless nights for some forward-looking steel officials is "What will happen when the volume drops off, and the wage rates remain the same?" It seems certain that if the hourly wage rates contained in present steel union contracts are thrown on the table for negotiation to a higher rate, the entire steel price picture will be opened up with a bang. Then will come the question "which comes first—the hen or the egg?" If wages are raised, will any value be obtained in keeping down inflation, if a steel price increase becomes necessary to carry the greater wage burden?

**MARINE WONDER:** Ships like this have done a heavy-duty job for the Navy. In the Sicilian Campaign this type of ship crossed the ocean with 4000 tons of cargo which included a 105 ft. tank landing craft, a 50 ft. tank lighter and other equipment. This ship is shown on a Navy test run after launching at the Ambridge, Pa., yards of American Bridge Co.



**TRAINER-FIGHTER CONVERTIBLE:** By removing the 37 mm. cannon, fuselage guns and gun cowlings, and extending the cabin enclosure, Bell Aircraft Corp. converted the P-39 into a two-place trainer. The larger dorsal fin and the fin under the fuselage permit directional stability. The forward cabin has a full set of controls. A special kit of parts enables quick conversion.



Acting upon the joint request of the Oil Well Supply Co., a subsidiary of U. S. Steel Corp., and the United Steelworkers of America, the National War Labor Board on Oct. 23 authorized extension of a maintenance of union membership clause to the salaried workers at the company's Oil City, Pa., plant. The board also authorized the extension of a check-off provision in the union contract to cover the salaried workers.

### Short Run Problem in Ball Bearings to Be Eased

Washington

• • • For the purpose of remedying the "short run" situation in the production of certain types of anti-friction ball bearings with its attendant loss of machine hours and manpower, the WPB has called a meeting for Nov. 12 of members of the industry who make these types of bearing. The meeting was suggested by industry representatives. Specifically discussion will deal with the possible concentration in sizes of radial and angular contact ball bearings, where "short runs" of such sizes now are being produced by two or more companies and where one or more of these companies felt their production could be increased by discontinuing the size and let one producer continue its production.

## Aluminum Extrusion Capacity Still Tight; Use of Rolled Forms Urged

• • • Because of the shortage of facilities for producing aluminum alloy extrusions, new designs should give first consideration to use of rolled form sections, says the Operating Committee on Aircraft Materials Conservation.

The committee points out that the aircraft standards committee has issued a catalog of rolled form sections. A warehouse stock of aluminum alloy strip is being established by Central Steel & Wire Co., Chicago. A new catalog of aluminum alloy extrusion dies also has been prepared.

Study of recent figures on capacity vs. demand shows no actual surplus of extrusion capacity will exist this year, says the committee. Capacity figures take into consideration use of rolled form sections, 14ST to replace 24ST, and the use of random lengths. Use of XA 75S alloy, which extrudes with more difficulty than 14S, will increase the load on extrusion presses. Modification center requirements are increasing. Demand for tube blooms and hexagon rod is increasing.

The Operating Committee gives metal stamping a genuine boost in a new conservation bulletin, citing savings made on the making of oil seal retainers, coupling nuts, a shaft locking ring, exhaust nipples, engine cowlings, gun ring sights and air defectors.

An indication of the easing supply situation with regard to aluminum was given by WPB last week in an amendment to Order M-1-i which releases this once highly critical metal for a number of additional war purposes and some essential industrial uses. It is also planned to use aluminum for some purposes where copper had been used thus conserving copper in favor of this now more plentiful metal.

Some of the new uses permitted for aluminum under the amended order include the adding of aluminum ingot to galvanizing baths, use of aluminum for foundry bottom boards, for jigs and fixtures used in aircraft manufacture, also in certain refrigerator parts and several kinds of technical apparatus.

## SWPC Starts Releasing Contracts

### New York

• • • The Smaller War Plants Corp. last week announced a move to begin interviewing small plants to determine those which could manufacture essential civilian products in the first quarter of 1944 on special allotments of controlled materials. OCR has supplied SWPC with a list of 700 essential civilian items which are to be contracted for production under these terms.

Announcement of this plan seems to follow a trend toward the easing of at least some civilian items. An SWPC spokesman said that it should help to fill some bare shelves next year. The list of 700 items has been held strictly confidential, but it was learned that a large portion of the products listed at present consist of wearing apparel and garments. The metalworking industries have not been left out entirely, however, as the list also contains items coming under the headings of consumer durable goods, electrical appliances and parts, household appliance parts, scientific and

medical equipment, some commercial equipment, plumbing and heating supplies as garden tools, lunch boxes, vacuum bottles, ice refrigerators, spring-wound clocks and phonograph records.

Most smaller plants on register

with SWPC already have been notified by letter to make application for production schedules. However, all small plants are invited to check with SWPC for work. The rules making a plant eligible are strict. A plant must be officially considered small, it must have previously manufactured the product in question, production of same must not interfere with any war production schedules in the plant and the total volume of production of the assigned item must not exceed the quota set out by the covering limitation order.

The SWPC has been instructed to interview and accept applications from small plants until Nov. 12 at which time the material requirements of such contracts must be referred to WPB for passing to the Requirements Committee.

Some of the first evidence of the recently announced SWPC drive to employ small war plants in manufacturing some 700 essential civilian items for OCR, appeared here late last week with the announcement of the placing of a sizeable contract.

Joseph G. Dellert, regional director of SWPC in the third region, reported the placing of a contract for 50,000 garbage pails at the same time he made public the nature of the new drive. He said that production on the garbage pail contract would start in about ten days, although in most cases, it is understood, recipients of contracts now will simply be permitted to apply for allotments of material for production in the first quarter.

## SWPC in 14 Regions Will Loan Up to \$25,000

• • • Regional loan agents of SWPC in the 14 regions over the country have the authority to make loans up to \$25,000 without consulting Washington.

The operator of a small business may make an application for a loan of \$25,000 or less to the SWPC loan agent in his district. He will be asked to designate a specific bank. The applicant and the SWPC loan agent will then go to the bank, arrange for the loan and SWPC will enter into a repurchase agreement up to 100 per cent.

Regulations governing these loans are to be as follows:

All applications (where more than 25 per cent will be used to pay any financial institution,

lending agency, fixed or other funded debt retirement) shall be sent to the Washington office for action by the board of directors.

The applicant shall absorb all out-of-pocket expenses necessary to closing the loan.

The borrower shall state that he has not paid, and that he will not pay, any fee, commission, or bonus for obtaining this loan.

The bank shall pay repurchase agreement charge of 1 per cent per annum at the end of each quarterly period.

The bank shall agree to exercise reasonable supervision over the activities of borrower which may affect the loan.

## Contract Cancellation Policy Will Be Based on Compromise; Packard Man Argues

### Washington

••• Testimony before the House Military Affairs Committee which ended Oct. 27 made one thing clear with respect to final government policy on contract cancellation. The Committee must reach a compromise from among the divergent views presented by the War Department, industry and the General Accounting Office.

The War Department and industrialists have maintained that prompt negotiated settlements by procurement agency contracting officers is the solution to the problem. With more vigor, the General Accounting Office has said that it must be given final authority to settle all contracts.

Business men have told the Committee that if the fixing of the value of inventories and war production machinery is not negotiated by contracting officers exercising business judgment, industry faces ruin. The reason would be that inventories and machinery would be frozen pending the GAO's settlement which is bound to be slow.

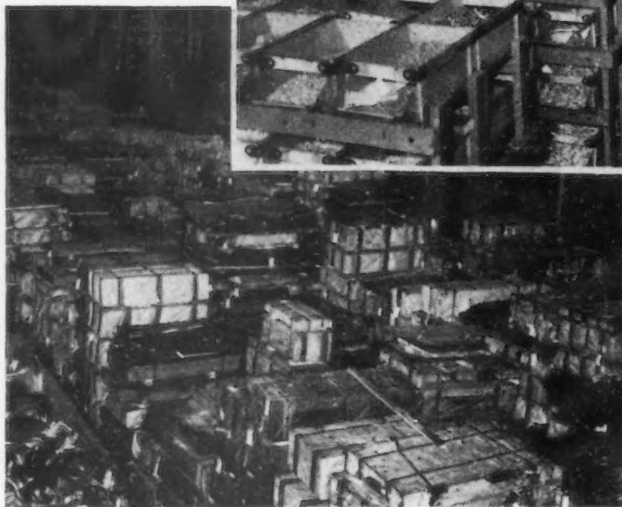
Members of the Committee have decided to accede to Comptroller General Lindsay C. Warren's arguments, so far as they are able without unduly crippling industry.

However, representatives fear what Mr. Warren would do if they did not listen to him.

Also, Committee members say that they cannot go too far in ignoring GAO, because they fear war scandals.

The compromise most likely to succeed would be the making of procurement agency decisions final with respect to the value of fabricated inventories, work in process and machinery. GAO participation in negotiations of the value of this property would not be opposed by either industry or the War Department. But, universal opposition could be expected from the business interests and the procurement agencies if GAO were given the veto power in these cases.

On the other hand, GAO would be permitted to overhead expenditures, plant amortization and all other accounting matters where the ordinary accounting laws could be expected to



**WHY QUICK SETTLEMENTS ARE NEEDED:** J. H. Marks of Packard Motor Co. exhibited these and other photos showing large inventories. It would take a huge force to make a detailed audit and much time might be consumed, he said.

answer the questions. Also, GAO would be permitted, under this suggested compromise, to check for fraud, mistake and mathematical error all papers used as a foundation for the entire settlement.

A powerful argument for industry was presented last week by James H. Marks, vice-president of the Packard Motor Car Co.

Mr. Marks said that his company had an invested capital of \$30,000,000, and contracts valued at \$1,250,000,000. He showed Committee members huge photographs depicting aluminum and steel in inventory occupying nearly two acres of plant space. Still other pictures showed huge supplies of work in process and vast expanses of factory space occupied by machines.

If these materials, inventories and machines were not quickly sold and the Packard Motor Co. promptly paid by the government for the value, the company would have to keep its plant cluttered up for an interminable

period while GAO counted. Moreover, he said forcefully, that if the wait were too long, it would mean financial ruin for the Packard Co. because it would not be able to meet debts to subcontractors and suppliers for the more than \$1,000,000,000 worth of contracts held.

While he did not condemn GAO for lack of competency, Mr. Marks showed that the job was too big for a detailed audit so far as inventory and machines are concerned.

Mr. Marks described his company's experience with GAO's manpower insufficiency. Examples were:

Cost-plus-fixed-fee contracts: only \$63,000,000 audited of a total of \$190,000,000; all contracts in 1941—71 per cent were two years behind; in 1942, 72½ per cent not audited; in 1943 to date, GAO is 65 per cent in arrears.

Mr. Marks said that the automotive industry has accepted \$26,000,000,000 in war contracts, or approximately 20 per cent of the national total placed with metal-working industries. This volume of business is spread over 44 states and 1375 cities.

Mr. Marks pointed out a few factors which would be involved in a detailed audit of war contracts by citing the following examples from the Murray Corp.

"The Murray Corp. has an order for

••• The cost of reconverting the Packard Motor Co. plants to produce automobiles once more was estimated to be \$3,000,000 by its vice-president, James H. Marks, in testifying last week. Mr. Marks said that the job would take six months.

only the wings of the Thunderbolt, or P-47," said Mr. Marks. "In those wings there are 4900 parts and 60,000 manufacturing operations. They have another contract for another airplane involving 3000 parts, and having 42,000 manufacturing operations. In another case, they have inner wings only with 4000 different parts and 100,000 manufacturing operations.

"So that a contract settlement made by accounting methods would involve listing every one of those parts in every stage of operation, determining the cost of each stage; piling those parts up after they had been audited and a so-called claim filled; wait until they had been checked over and then proceed with negotiations with respect to the amount the Murray Corp. would get for the work in process, when the contract was terminated. Many months would be required to complete such detailed accounting."

Citing an analysis made by the Automotive War Council of 245 member plants' contractual relations, Mr.

Marks said that it was found that there were 37,683 prime contracts, with 457,548 suppliers and having a total value of \$14,000,000,000.

Appearing as a member of the Committee on Termination of Contracts of the National Association of Manufacturers, Arthur G. Drefs, vice-president of the McQuay-Norris Mfg. Co., recommended enactment of legislation:

1. To authorize war procurement agencies to negotiate with contractors for the final settlement of cancelled war contracts;
2. To provide uniform policies and procedures to be followed by all major war agencies engaged in the settlement of cancelled war contracts;
3. To authorize and direct the making of advance or partial payments to contractors promptly on termination of war contracts;
4. To provide for contractors, as well as subcontractors and suppliers, an adequate opportunity to appeal to disinterested tribunals for review of adverse rulings or decisions of contracting officers in connection with the settlement of terminated contracts or subcontracts.
5. To authorize validation of informal commitments and arrangements not already converted into formal contracts, as was done by the Dent Act of 1919.

1. Contracting agencies should have the final word in contract termination, with no review except in the case of fraud.

2. Contracting agencies should be guided by general policies determined by a general policy termination review board.

3. In the interim contracting agencies should have specific authority to make advance settlements, but this should not be mandatory. If Congress should make these advances mandatory then some agency, other than the contracting agency, should do the work.

4. Contracting agencies should guarantee termination loans.

5. Surpluses should be disposed of by advertising, negotiation or turning them over to some semi-permanent agency set up for the purpose. Legislation affecting surpluses should not conflict with the provisions of the Merchant Marine Act.

6. The Government should finance the purchase of war plants.

• • • Senator James E. Murray, Democrat of Montana, chairman of the Senate Military Affairs Subcommittee on Contract Termination, told THE IRON AGE that he was thoroughly familiar with Senator Pat McCarran's plans for "two steel mills in every state" and re-centralization of basic industry and that he was in accord with them.

Mr. Murray recently attempted to get labor's view on decentralization. He asked A. F. Hinrichs, acting Commissioner of the Bureau of Labor Statistics, whether "after the conclusion of the war, and present problems are settled, won't there be a continued concentration of industry if some move is not now undertaken to decentralize industry?" Mr. Hinrichs said the problem was an important one, but he did not believe that efforts which might be undertaken would yield any substantial results.

## Land Advocates Speedy Settlements

### Washington

• • • The Army added another tally in its battle with the General Accounting Office over who shall have the final word in contract terminations when Rear Admiral Emory S. Land, Maritime Commission Chairman, testified before the Subcommittee on Contract Termination of the Senate Military Affairs Committee last Thursday.

Admiral Land said the United States would be better off with speedy settlements accompanied by a few inequities rather than a long, drawn-out, perfectly audited settlement, which might take months or even years to carry out.

He said that Congress should set up an agency to establish termination principles, or set up such principles itself; there should be one agency or one man to act as arbiter in all cases, with the ground work being laid by the procurement agencies.

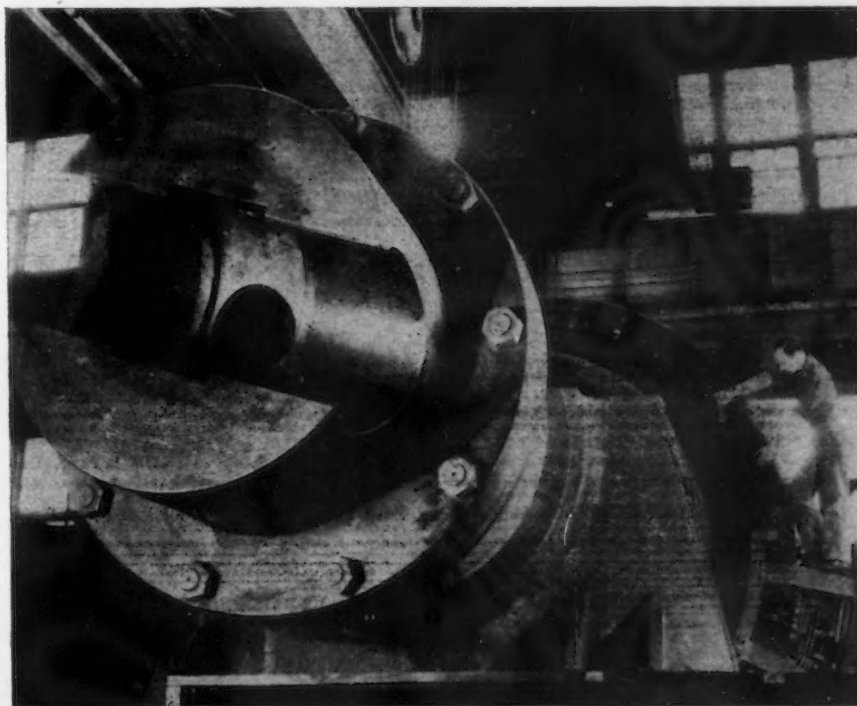
The Admiral said that since the OWM, under James Byrnes, was entrusted with the job of mobilizing the country for war it might be wise to place the demobilization in the same hands. He suggested OWM as the arbiting agency.

OWM, he said, could coordinate the procurement agencies as to termination and surpluses and then acting as a Board of Review give the policies established by Congress to these pro-

curement agencies and see that they are carried out. He went on record as favoring quick termination on a company basis.

Admiral Land presented the following suggestions which, summarized, are:

**A STRONG MOTOR:** Here is a close-up of a coupling on the shaft of a most powerful electric motor, built for the Geneva Steel Co. by General Electric.



## Post-War Uses for Electrolytic Plate Projected; Opportunity to Producers Seen

By D. C. MacDONALD  
Associate Editor

### New York

••• After many problems with the product, canmakers now are ready to admit, with conservatism, that electrolytic tin plate will have a definite place in post-war can production. This statement was made last week by K. W. Brighton, American Can Co. research scientist.

The conservatism of Mr. Brighton's statement lies in his limiting the apparent usefulness of the present lightweight 0.50 lb. electrolytic plate to containers for non-processed products such as coffee, biscuits, shortening, etc. However, he holds forth further hope for the growth of the product's usefulness by adding that the possibility of its use for processed cans depended mainly upon the weight of coating which would be required to equal the performance of hot dipped plate of heavier coating weights.

At present, he pointed out, 0.50 lb. electrolytic plate must be inside and outside enameled to provide performance approximating that obtained with hot dipped plate and that double enameled electrolytic plate costs more than plain hot dipped plate. If the corrosion resistance of electrolytic plate is not improved to the point where enameling is not necessary, a return to the use of hot dipped plate after the war is indicated, he stated.

Recent statements by steelmakers engaged in the manufacture of electrolytic plate have indicated that in their estimation heavier tin coating weights would permit electrolytic plate to equal the performance of an equivalent sheet in hot dipped. This would be particularly true if the melting method of brightening was used, they said. Mr. Brighton also mentioned this possibility, saying that heavier electrolytic coatings were being studied as a possibility for the packing of mildly corrosive foods. However, studies of performance have not progressed sufficiently to provide any definite evidence.

One place where a slightly heavier electrolytic coating, (0.75 lb.) has proved useful has been for canning evaporated milk, a mildly corrosive product. Results so far, Mr. Brighton reported, have been encouraging and it is anticipated that use of this weight for all canned milk going to

civilians will be possible soon.

Heat brightened electrolytic plate of 1.0 lb. coating weight may hold a strong possibility for a broad post-war usage with a considerable saving of tin over hot dipped coating weights, providing that this weight can be applied electrolytically on an economical basis, he said. Informed people, Mr. Brighton said, do not, however, believe that this weight can be economically applied on present equipment built specifically for 0.50 lb. coatings.

One of the brightest hopes for the future of electrolytic plate and its manufacturers appears in the fact that the electrolytic process adapts itself well to the highspeed plating of continuous strip, he said. Despite

predilections regarding the economic factors in applying heavier electrolytic coatings, some observers cling to the premise that the same high speed continuous methods that made the modern strip and sheet mill a success will also bring electrolytic plating methods to the fore when sufficient time has been had to put the process on an economy basis. Experiments early in the war emergency period when tin conservation was just a possibility, pointed away from attempted continuous hot dip methods and led the industry to construct electrolytic lines. It is believed quite possible that the ultimate efficiency of the electrolytic method will lead to an eventual conversion of the tin plate industry, he said. Canmakers, likewise, that have been forced to adopt and convert methods for the wartime use of electrolytic are expected to be quite willing to continue and even expand on the use of the newer product.

## Electrolytic Expansion Nearly Complete

### Pittsburgh

••• Practically all electrolytic tin plate lines in the steel industry now are capable of operation, providing

the orders are available. All but three out of the 27 lines will be completed by the end of the year.

During the latter part of this year it is expected that electrolytic tin plate shipments will constitute about 15 per cent of total tin plate purchases. It is believed, however, that electrolytic tin plate output in 1944 will fall short of previous optimistic estimate, but will, nevertheless, constitute a sizeable percentage of total tin plate production. Present indications are that between 30 to 35 per cent of the tin plate produced for sale next year will be electrolytic, with a possibility 40 per cent.

One factor which has caused a downward revision by observers in future output of electrolytic tin plate for the last quarter of this year and the first quarter of next year is the authority granted to use hot dipped tin plate for milk cans up to March 31, 1944. It had been originally intended that 0.75 lb. tin plate was to have become mandatory Oct. 1, 1944.

About Nov. 15 or thereabouts, a revised M-81 order is expected to be issued, which will further specify the uses for electrolytic tin plate.

The significant part of the entire electrolytic program is that through a phenomenal change, speeded somewhat by war conditions, the steel industry is now in a position to more than comply with all requests for electrolytic tin plate.

### Status of Electrolytic Tinplate Lines

November—1943

COMPANY	NUMBER OF UNITS	
	Now Operative	Ready by End of Year
Weirton Steel Co. ....	3	..
Crown Cork & Seal ....	1	..
Bethlehem Steel Co. ....	3	..
Crucible Steel Co. of America .....	1	..
Youngstown Sheet & Tube Co. ....	2	..
Granite City Steel Co. ....	1*	..
Jones & Laughlin Steel Corp. ....	2	..
Inland Steel Co. ....	2†	..
Republic Steel Corp. ....	1	1
Wheeling Steel Corp. ....	1	..
Carnegie - Illinois Steel Corp. ....	6	..
Tennessee Coal, Iron & R.R. Co. ....	1	2
	24	3

\*—Dull finish.

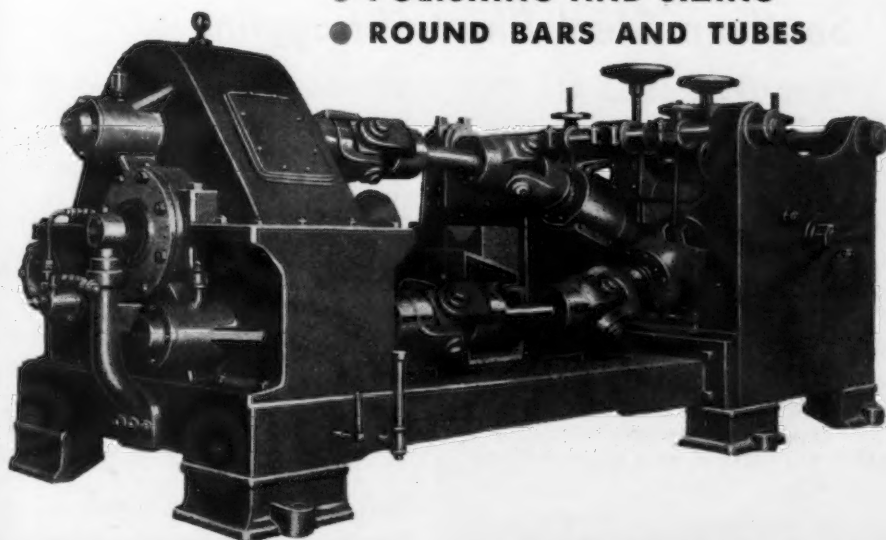
†—One on dull finish.

NOTE: A few of the lines shown above as "Now Operative" might possibly need some last minute quick adjustments, etc., before reaching full operation. However, they are so close to completion that they have been classified that way. A pick-up in electrolytic tin plate orders would furnish the necessary impetus for such final adjustments.



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Rugged design and construction permits constant operation at highest speeds. Medart Smavroc alloy steel rolls mounted in Timken equipped yokes assure minimum operating costs.



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## Fourth Major Coal Strike Hits Nation; War Effort May Suffer Soon

### New York

••• On Monday the nation's coal miners started the fourth major coal strike since May 1. The steel industry, already hard hit by the three previous major strikes and the sporadic walkouts which have crimped coal production since Oct. 16, faced greatly reduced operations. Coal piles of several large producers were down to one to three weeks' supply.

Attorney General Biddle was reported Monday to have the papers prepared with which the government might again seize the more than 3000 mines. John L. Lewis, confined at home with a cold, had made no statement but CIO's Philip Murray, an ex-vice-president of the UMW for 20 years, publicly assailed strikes and strikers as Axis assistance.

A 200-man union policy committee hailing from 26 coal producing states was due to meet with John L. Lewis in Washington to work on an agreement on Monday. The President has promised to withhold decisive action on the strike until this committee has had an opportunity to make a decision. Following this the President has promised a strong move, the nature of which is pure conjecture.

Approximately 35,660 tons of steel and 57,300 tons of pig iron have been lost since Oct. 16 as a result of the coal strikes in Alabama and Indiana, WPB announced last Saturday.

In the Birmingham district alone 17 furnaces have already gone down, eight blast furnaces and nine open hearths. Losses in war implements and shipping may also become seri-

ous, the board pointed out, if there is a further decline in steel production. Coal production, which was hit ultimately by the walking out of nearly 90,000 miners in 11 states this month, is reported for the week ended Oct. 23 to be 485,000 tons below the previous week.

The sporadic strikes began Oct. 16 with the walkout of about 25,000 miners in Alabama and Illinois. While a return to work movement seemed in progress during the time WLB was considering the Illinois Operator's wage agreement this soon reverted again to a further walkout when WLB made a counter wage suggestion. The walkouts then spread to 11 states and included about 90,000 miners in nearly all fields. A complete strike will affect about 450,000 bituminous miners and some 80,000 anthracite miners.

Under the Illinois Operator's wage agreement the miners stood to gain about \$1.50 per day in overtime and

portal-to-portal pay plus an allowance for tools and an increased vacation allowance. The WLB counter proposal would give the men about \$1.12½ per day plus the other allowances. John L. Lewis, in commenting on the new schedule, said that it amounted to cutting the present scale by 4½c. per hour and refused to accept the terms. The WLB scoffed at Lewis' arithmetic and said that the new plan would increase the weekly wage by about \$10 per six-day week, a fact since confirmed by President Roosevelt. WLB has agreed to put a guarantee in its wage proposal assuring the miners of making as much on straight time as was possible under the old contract, thus removing the presently most difficult objection to the new plan.

The President has within his powers to hold the miners on the Smith-Connally Anti-Strike Bill since no government certified strike vote was taken and no 30-day cooling off period observed. He may cancel selective service deferments and ask reclassification of every draft eligible miner. He may also confiscate the union's dues and hold them in escrow.

## Southern Steel Plants Struggling

### Birmingham

••• "Shutdown of the Tennessee Coal, Iron & Railroad Co.'s Ensley works scheduled for Oct. 31 has been temporarily postponed," the company said. The maneuvering of certain materials would allow the plant to operate through Monday and possibly through Tuesday. Meanwhile the company is operating four open hearths out of nine and one blast furnace out of six

at Ensley. It is operating eight out of nine open hearths at Fairfield and two out of three blast furnaces there. Republic Steel, which had operated six out of eight open hearths for the first part of last week, put one of two idle 125-ton furnaces back on last Friday and hopes to operate seven out of eight for the current week. The company with only one of its four Alabama blast furnaces in blast is getting iron from outside sources. No union mines were operating Monday in Alabama.

## Illinois Miners Out; Coal Stocks: Two to Several Weeks

### Chicago

••• With the exception of mines represented by the AFL progressive mine workers union all of Illinois coal mines were idle Monday. This means about 80 per cent of the mines in the state. However, most steel producers have inventories ranging from a short two weeks in the case of a principal pig iron producer to several weeks supply. So far as we have been able to determine no curtailment has been made in pig iron production.

**WITH COMPLIMENTS TO ADOLF:** Close-up of an 8000 lb. bomb in front of the Lancaster bomber which will carry it on a night raid over Germany.



## Pennsylvania Mines Go Down; Damage Viewed As Irreparable

### Pittsburgh

• • • Despite any settlement that is made in the coal controversy, irreparable damage probably has been done already to this No. 1 steel center by the latest series of coal mine stoppages. No steel mill in this district will, from now on, be in a position to replenish coal supplies to the point where a safety factor against the extreme cold weather can be fully established. It is believed that the effects of the latest outlaw strikes still will be felt months after the conclusion of the present coal fiasco.

Early this week all captive mines of the steel companies in western Pennsylvania were shut tight, thus stopping the flow of coal to stock piles which had already dwindled to a point where they were the lowest in the industry's history, when compared with the exceptionally high operating rate. Not once in the past several months has the United States Steel Corp. giant Clairton works been able to get much if any beyond six days' supply of coal. Officials say that at least 15

days' supply, or a half millions tons, is necessary to take care of any seasonal or other types of emergencies. With such a small supply of coal on hand, severe emergencies require an early cutback to spread out available coal. This has continually resulted in the banking of blast furnaces and a loss of steel production urgently needed for the war effort.

These series of shutdowns, including the latest, have had a decided effect upon the morale of steel workers as well as coal miners. In addition to the actual stoppage of coal mining, the decline in coal mining efficiency is almost of similar import.

The Pittsburgh district operating rate which had reached new highs in the past few weeks is expected to slide to 100 per cent average for this week, directly due to the coal strike. Early in the week the 100 per cent operating figure appeared probable, but it might go below that before the end of the week, depending upon the outcome of the coal situation. Every effort is being put forth to maintain the rate as high as possible.

• • •

## Steel Coal Stocks Average 10 Day Supply

### New York

• • • Reserve coal piles of leading Eastern iron and steel producers are equivalent to an average of about ten days. E. G. Grace, president of Bethlehem Steel, stated last week that his company has about eleven days supply. All Bethlehem coal mines were idle Monday.

A Bethlehem spokesman said that no curtailment in iron or steel operations had been made by Monday afternoon. But obviously, he said, if the strike goes on steelmaking units will start going down in a matter of a few days.

Bethlehem Steel Co. for the third time this year set a new all-time monthly production record by making 1,127,233 tons of steel in October, E. G. Grace, president of the company, announced Monday.

This record beat the best previous mark, set in August of this year, by 8704 tons and surpassed the March, 1943, record by 13,670 tons.

The American Iron & Steel Institute estimated steel ingot output at 100 per cent this week, a decline of 0.6 per

cent from last week. This compares with an estimate by THE IRON AGE of 99 per cent, a decline of one-half point from last week. All rates this week are tentative.

Not generally reckoned when coal strikes cause losses of production is

the fact that costly coke oven by-products are lost. Many of these by-products are exceedingly vital to the war effort.

The current stoppage at the mines also is a threat to the nation's railroad transportation setup. Some of the larger carriers have watched their stockpiles dwindle in recent months the same as steel and iron makers.

It is estimated that the nation's bituminous coal supply is 25,000,000 tons short of what it should be at this time of year. Furthermore, the coal is very unevenly distributed.

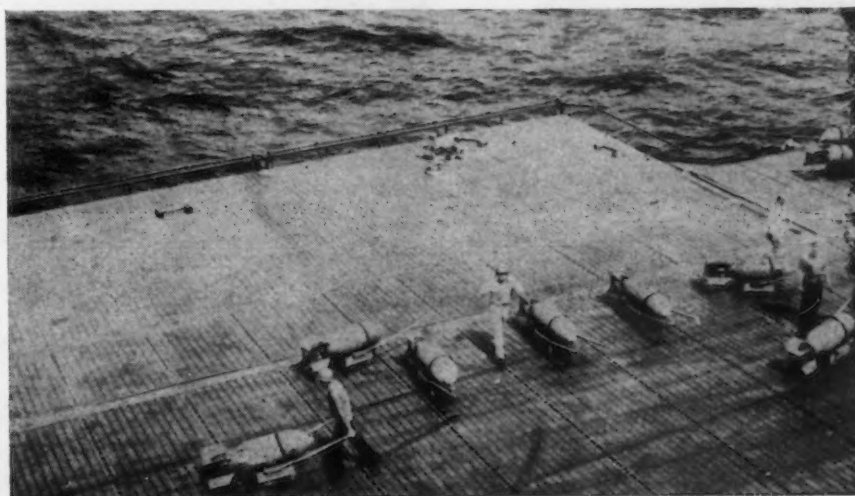
Alan Wood Steel Co., Conshohocken, Pa., reported a 10-day supply of coking coal with which it expects to maintain full operations until the supply is exhausted.

## 50% Cutback in Steel, Coke Anticipated by End of Week

### Pittsburgh

• • • A continuation of the coal mining strike throughout this week is expected to result in some steel losses here toward the end of the week. Every effort is being put forth to maintain operations at as high a point as is practicable. A mine shutdown lasting into Wednesday or Thursday of this week would see a cutback in operations to possibly 50 per cent at the Carnegie-Illinois Clairton by-product plant. A short time after this cutback it would be necessary for the management to reduce pig iron output, which in turn would cause a decline in steel production. In case the coal miners do not return to work next week, as reported previously, operations in this number one center will be off considerably.

**ABOARD AN AIRCRAFT CARRIER:** Sailors roll out 1000 lb. bombs preparatory to loading them aboard the planes of a combined Army and Navy force which shortly took off to attack the Jap-held Tarawa in the Gilbert Islands.



## Navy and Government Surplus and Salvage Property to Go on Open Market

### Washington

• • • The Navy Department has announced that arrangements are being made to establish several offices throughout the United States to facilitate the merchandising, on the open market, of all salvage and surplus property no longer of use to any Naval activity or other Government agency. About 12 offices will be set up.

The 12 or more domestic offices will be operated by the Bureau of Supplies and Accounts. That Bureau administers the disposal of salvage material, scrap, and surplus stocks within the Naval establishment, and in private plants doing Navy work. The Office of Procurement and Material fixes policies for the disposal, subject to any rules the Vice Chief of Naval Operations may wish to prescribe and coordinates Navy property disposal policies with those of other agencies.

Locations for the branch Material Redistribution and Disposal Offices will be selected on the one hand with a view to their proximity to Navy contractors and Naval establishments originating materials, and on the other hand, with a view to their closeness to markets for such materials. Two are now in operation, one at 342 Madison Ave., New York, 17, the second at 605 Furniture Mart Bldg., 1355 Market St., San Francisco.

Each of the branch offices will act as a clearing house for all surplus materials available within its district, and will disseminate information as to what materials are offered for sale. All material will be grouped into 20 broad categories, to simplify inquiries and bidding. Each office will maintain lists of bidders interested in material covered by each of these categories. Each office also will keep cross indexes of all material offered in all other districts.

In this way a prospective buyer may ascertain by mail what materials of interest to him are available in any region of the United States. Interested parties may signify an interest in one class of materials without having to digest voluminous catalogues of everything the Navy has in the way of surplus materials.

All persons who desire to bid on any quantity of any type of Navy salvage or surplus material, if not

included on the current Navy bidders' list, may forward their names to the Navy's Material Redistribution and Disposal Office in New York.

If the material cannot fill any other Naval or governmental need, then it is considered surplus and sold. The method of sale of surplus, or salvage, is normally by sealed bid, and of scrap by allocation. In case of military necessity negotiated sales are sometimes authorized. Many salvage materials are sold through allocation upon recommendations of WPB and under the regulations of OPA.

A further policy with respect to the sale of surplus material is to protect all types of bidders, regardless of size, through the following procedures:

Award is made to the highest bidder, all other factors being equal.

Deposits and terms are identical for all bidders.

All citizens of the United States, regardless of the size of the organization they represent, are permitted to bid.

Wherever possible materials are sold by sealed bid so that all interested parties may participate.

Whenever possible, the lots of material are so divided that the small bidder can bid on only the items in which he is interested.

Sufficient time is allowed between advertising and return of bids to permit all parties to inspect the material.

All sales are made on an "as is, where is, and if is" basis without recourse after an award has been made.

**FLYING FISH:** American Can Co. turns out these aerial torpedoes by mass production methods in its St. Louis "Amertorp" plant. This is a view of the final assembly line.



## Hydraulics May Dehydrate Foods

• • • Highly successful tests on a hydraulic compression unit promise commercial production of compressed dehydrated vegetables, on a large scale, in the near future. These tests, under the supervision of the War Department, were recently conducted at a West Coast plant on the hydraulic compression unit developed by the Baldwin Southwark Division of the Baldwin Locomotive Works, Philadelphia, and were directed by Dr. John C. Sluder, consultant to the U. S. Army Quartermaster General's Office and assistant professor of food technology at the Massachusetts Institute of Technology.

The initial runs were made on dehydrated carrots, the unit turning out 2 lb. bricks at the rate of four per minute. Additional compression units are now under construction at the Baldwin Southwark plant.

## Republic Celebrates "M" Award and New Furnaces

### Cleveland

• • • A dual ceremony of accepting the Maritime "M" award and the lighting of the new Defense Plant Corp. No. 5 blast furnace was held at Republic Steel Corp., Oct. 28, with about 4000 Cleveland district Republic employees in attendance. The furnace, equaled in size by only one other unit, will have a daily capacity of 1300 tons of pig iron. Construction was started in February, 1942.

## C-I Sets Safety Record

### McKeesport

• • • An entire year of steelmaking without a lost-time accident in any of its departments was chalked up in October by the Wood Works of Carnegie-Illinois Steel Corp.

A. E. Fletcher, Wood Works' safety director, gives most of the credit for the achievement to the plant supervisors who have coordinated the training procedures in each department.

## Keystone Steel Reports

• • • Keystone Steel & Wire Co. reports for the third quarter a net profit of \$236,151.82 including provisions for depreciation of \$138,697.06, and after a total tax deduction of \$345,177.88. Earnings were 31c. per share.

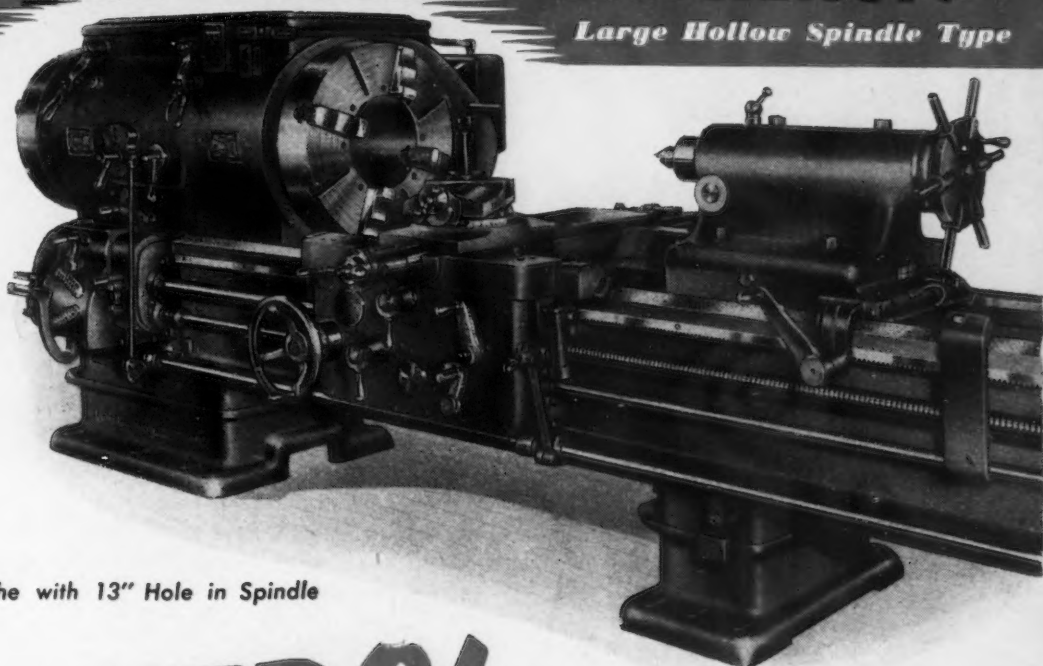


# FIVE SIZES

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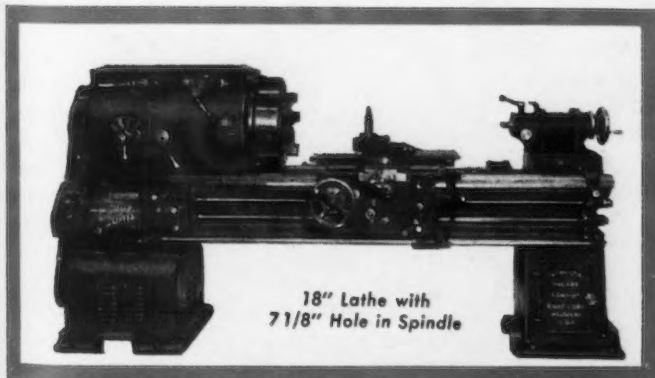
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*Large Hollow Spindle Type*



30" Heavy Duty Lathe with 13" Hole in Spindle

## HYDRATROL LATHES



18" Lathe with  
7 1/8" Hole in Spindle

### 8 Distinctive Features

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- ★ Hydraulic Brakes and Clutches.
- ★ Absence of Mechanical Troubles.
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- ★ Available with Large Turrets for carriage which fully utilize the Great Power Capacity of these machines; and Beds on both ends of Headstock.

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MACHINE COMPANY

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## Seven Alloy Steel Types Directed Exclusively to Electric Furnace Melts

### Washington

• • • John T. Whiting, director of the WPB Steel Division, last week announced seven specific types of alloy steel, classified by end use, which must now be melted in electric furnaces only and may not be melted in open hearths. This was contained in Direction 2 to Supplementary Order M-21-a. It was emphasized that this was an emergency direction to alleviate a threatening shortage of open hearth carbon steels but would not affect orders for delivery after March 31, 1944. Furthermore, Mr. Whiting stated that the division would constantly review the direction and be in a position to revoke it at the earliest possible time.

The seven specific types of alloy steel, classified by end use are: (1) All airborne aircraft steel where aircraft quality is specified (2) all airborne aircraft tubing (3) all armor-piercing shot body and cap steel, 20 mm. and larger (4) all steel for integral parts of small arm rifles and machine guns, up to and including 60 caliber, excluding mounts and tripods

(5) all steel for integral parts of guns, cannons, rifles and howitzers, 20 mm. and larger, excluding mounts and carriages (6) all bearing steel, including carburized grades (7) all gear steel, excluding gears made from plate.

The lack of balance between alloy and carbon steels was reported to have grown out of the necessity to melt alloy steels in open hearths during the expansion program for electric furnaces. Now that electric furnace facilities have been completed and some electric furnaces are even lacking in orders, the action is intended to again return alloy tonnages to the electric furnaces leaving open hearth facilities open to concentrate on plain carbon steels.

Steel producers with either open hearth and electric furnaces or only open hearth facilities are now required to file report form WPB 2933 properly classifying orders and indicating diversion of facilities according to the direction. Producers with only electric furnace facilities are not required to report.

## Ceilings Set on Steelmaking Alloys

### Washington

• • • Previously covered by the General Maximum Price Regulation with ceilings fixed at the highest prices individual sellers charged during March, 1942, OPA on Tuesday issued a specific regulation providing dollars-and-cents ceilings for a group of important steelmaking alloying metals, effective Nov. 8. OPA said that the change to a specific regulation was made so that prices would be better known to consumers. The ceiling prices covered in the new regulation, with minor exceptions, are the same as those that prevailed under GMPR. The new regulation is titled Maximum Price Regulation 489.

The new dollars-and-cents ceilings for some of the more important of the alloys and metals are as follows:

Tungsten—Ferrotungsten, \$1.90 a lb. of contained tungsten in quantities of 10,000 lb. or over.

Molybdenum—Ferromolybdenum, 95c. a lb. of contained molybdenum; molybdc oxide and calcium molybdate, 80c. a lb. of contained molybdenum.

Vanadium—Ferrovanadium, open hearth \$2.70, crucible \$2.80, primos \$2.90 a lb. of contained vanadium.

Cobalt—Cobalt metal for metallurgical use, \$1.50 a lb. in kegs 500 to 550 lb.

These are only some of the dollars-and-cents ceilings established by the regulation.

Other specific prices are provided for smaller quantities and different grinding sizes of the foregoing alloys and metals. In addition, specific premiums are allowed for spot sales of ferrovanadium and cobalt metal.

Dollars-and-cents prices also are established for ferrophosphorus, simi-

nal, alsiifer, calcium, metal, calcium silicon, and calcium-manganese-silicon.

Maximum prices for alloys and metals covered by the regulation for which no specific prices are established, OPA said, are to be determined on the basis of the highest prices charged by the seller during the months of January, February or March, 1942.

The pricing base period for such alloys and metals was broadened to the first three months of 1942, contrasted with March, 1942, under GMPR, because of the infrequency of sales of some of the items.

If the seller cannot determine his maximum price for any type, grade or size of alloys or metals by either the dollars-and-cents pricing provision or on the basis of January-March, 1942, prices, he shall submit a proposed price to OPA for approval.

## Procuring Claimant Agencies Now Defined

### Washington

• • • The term "procuring claimant agencies" has been clarified by an interpretation to CMP Regulation 1. The procuring claimant agencies are: (1) War Department (including Ordnance), (2) Navy Department, (3) Maritime Commission, (4) Aircraft Resources Control Office and (5) the Office of Lend-Lease Administration.

In some instances, the treatment of orders by such claimant agencies differs slightly from that in the case of other claimant agencies. The term is used in Direction 3 to CMP Regulation 3, which points out that all procuring claimant agencies must place allotment numbers on their orders.

The clarification also points out that other than those claimant agencies appearing above are sometimes referred to as non-procuring claimant agencies.

## COMING EVENTS

Nov. 10, 11—Industrial Hygiene Foundation, Pittsburgh.

Nov. 17, 18—National Founders Association, New York.

Nov. 17, 18—Galvanizers' Committee, Pittsburgh.

Nov. 19—Steel Products Warehouse Association, Inc., Chicago.

Nov. 29 to Dec. 3—American Society of Mechanical Engineers, New York.

Dec. 6 to 11—19th Exposition of Chemical Industries, New York.

April 2 to 5, 1944—The American Ceramic Society, Inc., Pittsburgh.

## Binder Industry Asks Parts Inventory Release

### Washington

• • • Procurement of iron and steel metal parts and units used in the blank book, loose leaf and binder industry, and the release of finished parts in inventory were discussed recently at a meeting of the WPB Blank Book, Loose Leaf and Binder Industry Advisory Committee in Washington.

## New Machine Items Brought under MPR-136

### Washington

• • • Several new items of machinery were brought within the provisions of the regulation controlling maximum prices of machines and parts and machinery services by OPA last week.

Some were taken from the coverage of other regulations, and others, already covered by the machinery regulation, were shifted to different classifications for purposes of simplification.

The following new items previously covered by either Maximum Price Regulation No. 188 or the General Maximum Price Regulation, are now added to Maximum Price Regulation No. 136, as amended.

Dressers, abrasive wheel (except diamond dressers).

Pipe and tube tools manually operated, including beading, belling, bending, cleaning, cutting, expanding and flaring, and wrenches for operating.

Jacks and jack screws, manually operated.

Tools, manually operated for the cutting, forming, and punching of metals.

Vises, all types; vise mounts, stands and supports.

Springs (except springs subject to Section 1390.32, Appendix A, and bed and furniture springs).

Wheels (except those specially designed for military use and subject to Section 1390.32, Appendix A, Revised Price Schedule 6, Maximum Price Regulation No. 246, and Maximum Price Regulation No. 452).

X-ray equipment.

The general level of prices for the above items will not be affected, OPA pointed out, as their base date under

Appendix B of the machinery regulation to which they have been transferred and the base date of the regulations previously covering them is March, 1942.

The changes, through Amendment No. 101 to Maximum Price Regulation No. 136 (Machines and Parts and Machinery Services) become effective Nov. 1, 1943.

## Clarification Issued in Machinery Price Regulation

### Washington

• • • OPA has clarified the meaning of base date prices used by manufacturers, sellers and lessors to compute ceilings for new machinery and machinery parts.

Maximum Price Regulation 136

froze "confidential list prices" in effect on the base date specified in the regulation. For the purpose of simplicity the action establishes maximum prices by reference to "established prices" in effect on the applicable base date instead of confidential list prices.

## AA-1 Ratings for Facilities

### Washington

• • • WPB last Thursday announced that producers of steel in controlled material form may use the AA-1 preference rating assigned under CMP Regulation 8 to obtain the use of facilities as well as for the acquisition of materials. This action, contained in CMP Regulation 8, as amended Oct. 27, conforms to Priorities Regulation 3 which permits the use of preference ratings to get the processing of raw materials which will be delivered.

## Priority Changes

L-41—Dir. 1 grants the Department of Agriculture County War Boards authority to process construction applications from farmers where the project does not cost in excess of \$10,000. (10-25-43)

L-157—Sched. VII reduces the number of models of wheelbarrows from 80 to 10. (10-21-43)

L-193—Amended order removes provisions requiring authorization of engineering services, bids and estimates, and placement of purchase orders. (10-26-43)

L-203—Amended order covering electrical indicating instruments now conforms with Order M-293. (10-26-43)

M-1-1—Amended order permits more uses of aluminum when the use is directly connected with the war program or if it contributes to it.

M-2-b—Amended order simplifies and eliminates paper work. (10-28-43)

M-9-b—Amended order provides that generators of copper scrap amounting to 5000 lb. or more per month report on Form WPB 452. (10-25-43)

M-21-a—Dir. 2 provides that alloy steel for certain end uses is hereafter to be produced only in electric furnaces and not in open hearth. (10-27-43)

M-21-b-1—Dir. 2 reduces deliveries of prime quality plate to warehouses. (10-25-43)

## Additional CMP Developments

• Dir. 6 to Reg. 5 provides that pleasure vessels operating under the flags of friendly foreign nations are not eligible to use the AA-1 preference rating assigned under Reg. 5 to obtain MRO supplies. (Release No. WPB-4464)

• Amdt. 1 to Dir. 35 of Reg. 1 rules that application for authority to purchase Class A facilities under the order must be filed with the local WPB offices rather than with WPB, Washington. (Release No. WPB-4454)

• Int. 20 to Reg. 1 differentiates between "procuring" claimant agencies and "non-procuring" claimant agencies.

• Amended Reg. 8 outlines procedures under which controlled materials producers may obtain controlled materials, Class A products, Class B products and other materials required as production materials for the production of controlled materials.

## Price Briefs

• Amdt. 38 to SR 11 exempts from price control the service of fabricating concrete reinforcing bars owned by the United States government and its agencies. (Release No. OPA-T-1372)

• Amdt. 101 to MPR 136 brings several new items of machinery within the provisions of the regulation. (Release No. OPA-T-1371)

• Amdt. 25 to MPR 188 adds "ladders manufactured for industrial plants" to the list of commodities in Appendix B of the order making them eligible for individual price adjustments. (Release No. OPA-3361)

• Amdt. 103 to MPR 136 clarifies the meaning of base date prices used by manufacturers, sellers and lessors to compute ceilings for new machinery and machinery parts. (Release No. OPA-T-1379)

## New WPB Forms

WPB-1314—Anti-friction ball and roller bearings: Report of shipments, orders and inventory. Monthly.

WPB-1689—Production and shipment: Schedule of construction machinery.

WPB-558—Foundry equipment and supplies: Manufacturer's monthly report of shipments and unfilled orders. Monthly.

WPB-1013—Zinc allocation certificate. Monthly.

CMP-4C—Application for allotment of controlled materials for construction and facilities previously authorized on PD-200.

WPB-2633—Steel producers' monthly report of shipments and past due orders. Controlled carbon steel (including wrought iron) and alloy steel products, excluding steel castings.

WPB-2057—Mechanics hand service tools: Manufacturer's monthly report of shipments and unfilled orders.

WPB-1459—Radio industry manufacturer's monthly report on deliveries.

WPB-1440—Metal forming and shaping machines: Shipments and orders report. Monthly.

WPB-1888—Producer's semi-monthly progress report on tin mill products orders and shipments under OEW allotment.

WPB-2872—Nickel chemicals: Supplier's schedule of deliveries and application for allocation.

WPB-2022—Zinc dust allocation certificate.

WPB-3302—Portable pneumatic and electric tools, metal working saws, hack saw blades and industrial files: Manufacturer's monthly report of shipments and unfilled orders.

WPB-3333—Anti-friction bearings: Application for authority to accept delivery.

WPB-652—Monthly steel plate order report.

WPB-653—Summary of steel plate order reports.



BY DON JAMES

News and Markets Editor

••• Always beset by a multitude of problems because of the diversity of items they make, producers of steel wire and allied products have been hurdling one tight spot after another ever since the war began. But as in other divisions of the steel industry, the experience and ingenuity forced by the war upon wire firms will accrue to the benefit of post-war consumers.

Nails, welding wire, mesh, rope and other items have been in the spotlight at various times because of terrific

## War Has Been Series of Emergencies For Nation's Steel Wire Drawing Mills

demand, each peak bringing its own peculiar problems. Equipment and manpower deficiencies have been felt keenly at times, while always in the background has been the difficult semi-finished steel problem.

Welding rod output, which averaged around 18,800 tons per month in 1941, jumped to an average of about 33,000 tons per month in 1942, with most of the gains being made in late 1942. In January of this year output was at the 40,000-ton level, in March it was at the 48,000-ton mark and since then it has averaged over 50,000 tons per month.

One outstanding feat will be the production of about 350,000 tons of rope this year, about a 33 per cent gain over 1942. The acute demand for rope has shifted to small sizes, a large portion of which is galvanized, thereby stretching galvanizing capacity.

Great emphasis has centered recently upon the making of more fine, high carbon wire for aircraft cable. It has been necessary to change over many drawing machines and to obtain additional heat treating facilities (the latter constantly a source of concern during the war).

Stainless wire for aircraft parts is another, hot spot currently. To fill urgent demands for this wire has taxed the ingenuity of the industry.

At the start of the war, wire pro-

ducers thought they would run immediately into high demand for barbed wire, as in World War I. The big requirements did not arise for some months. There was a spurt eventually from military sources, but then it relaxed and the wire was diverted to domestic consumption, where it was urgently needed for farms.

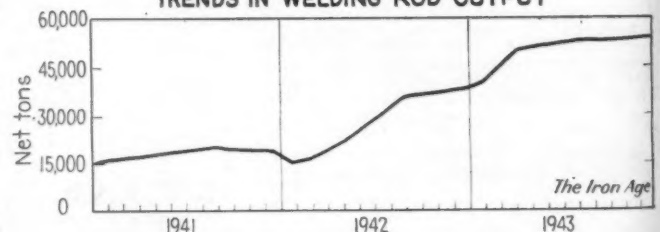
The far-famed bullet core project which the wire industry undertook is another achievement of the war, previously publicized. Not long after the problem had been licked demand began to slide off.

In at least one instance, about a year ago, the industry went to great effort to produce wire for a foreign nation, only to see the material go into storage in this country. It was still in warehouse a month ago.

High production of camouflage netting and materials for landing field mats has been another way in which the industry has helped in the war.

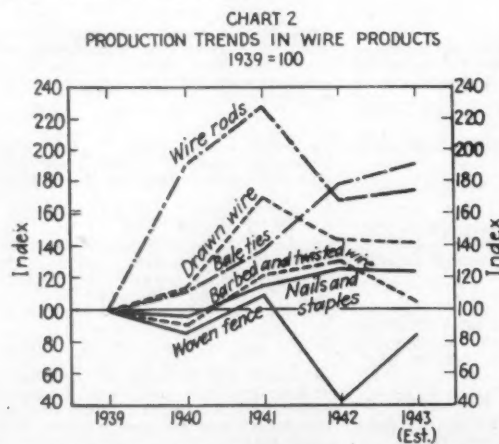
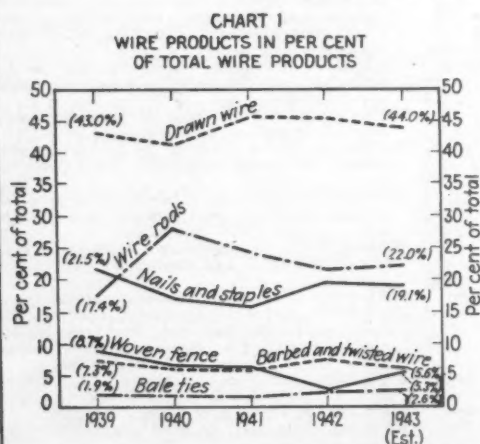
Production of nails and staples for sale rose from 782,234 net tons in 1941 to 845,249 net tons in 1942. This year production of the humble but useful product will total around 825,000 tons,

TRENDS IN WELDING ROD OUTPUT



WAR TRENDS IN WIRE PRODUCTS PRODUCED FOR SALE

1939-1943

Source: Amer. Iron & Steel Inst. - Compilations: *The Iron Age*

if the average of the early part of the year is maintained. All told, that's a lot of nails!

## Grace Predicts Reconstruction Role

• • • Steel from the United States will play a big part in the rebuilding of Europe when peace comes, predicted E. G. Grace, president of Bethlehem Steel Corp., at his press conference Oct. 28. He added that "there always will be ways and means of paying for the work."

Mr. Grace reported net profit of \$6,573,892 for the third quarter of 1943, compared with \$6,614,210 in the previous quarter and with \$7,444,870 in the third quarter of 1942. Net billings set a new high of \$519,097,264, comparing with \$490,414,380 in the second quarter. Net income was only 1.27 per cent of sales comparing with 1.68 per cent during 1942 and

3.59 per cent in 1941, Mr. Grace said.

Steel production averaged 102 per cent of capacity during October, breaking all records. Other highlights included:

**Payrolls:** An all-time peak was set in third quarter at \$231,113,000. Average employment in the quarter was 295,740. Company could use up to 300,000 persons. Average hourly earnings in the quarter were \$1.314 vs. \$1.288 in second period.

**Shipbuilding:** Hasn't reached its peak in Bethlehem yards yet. Order backlog for Navy extends through 1944 and 1945.

**Coal Strike:** Company has only 11 days' supply in stock and would start trimming operations immediately upon a start of a general coal strike.

**Renegotiation:** Incomplete. Sessions with Navy board will begin next month, covering 1942.

**Scrap:** Supplies are o.k. at the moment, but "we are losing inventory and are not on easy street. There must be no letup in the scrap drive."

## U. S. Steel Corp. Payrolls at Peak

### New York

• • • In the third quarter of this year, the payroll of U. S. Steel Corp. at \$230,000,000 was the highest in history, stated Irving S. Olds, chairman, at his press conference Oct. 26. Employees including shipyard workers totaled \$44,093, also the highest in history, and as of Sept. 30 the corporation was bossing 36,749 women, 60 per cent of them wage earners.

Hours lost through strikes were equivalent to more than an hour for every employee during third quarter. There were 380,000 man hours lost as the result of work stoppages in various subsidiaries including coal mines.

Other highlights of Mr. Olds' conference (the financial report was summarized in last issue, page 106B) included:

**Coal Stocks:** Reserves are "pretty scant" in most locations. All corporation mines in Alabama and Kentucky were down Oct. 26 and the Kentucky stoppages were threatening to slow the Gary works.

**Iron Ore:** The corporation won't bring down as much Lake Superior ore this year as in 1942, but if given a break in the next few weeks on the Great Lakes weather, it will have enough to last through the winter.

**Scrap:** The situation is important and the national campaign deserves fullest support.

**Tin Plate:** Of nine new electrolytic lines, all but two are finished and one is idle through lack of orders.

**Steel Shipments:** The decline this year is due to the product mix which a year ago consisted largely of heavy products. Incidentally, ingots when shipped are classed as finished steel. On a tonnage basis, export shipments in third quarter were 7.3 per cent of total shipments.

• • • Republic Steel Corp. reported third quarter consolidated net income of \$2,452,869 after all charges, including provision of \$8,450,000 for estimated Federal income and excess profits taxes. This compared with \$2,581,100 net for the corresponding quarter of 1942. Consolidated net income for the first nine months this year was \$8,456,601, after provision of

\$38,050,000 for Federal income and excess profits taxes, compared with \$10,653,221 net for the first three quarters last year.

**Youngstown Sheet & Tube Co.'s** third quarter net profit dropped to \$2,098,786, compared with \$2,257,424 for the second quarter. Gross earnings dropped from \$12,105,845 during the third quarter last year to \$11,902,312 for the second quarter and \$10,832,972 for the third quarter this year.

**American Rolling Mill Co.,** for nine months ending Sept. 30, reported consolidated net income of \$5,404,405 after charges and taxes, equal, after preferred dividend requirements, to \$1.35 a common share, compared with \$6.075,321, or \$1.59 a common share, in the similar period of 1942. For the September quarter, net income was \$2,174,708, or 56c. a common share, compared with \$2,740,993, or 78c. a common share, in the similar period of 1942.

Inland Steel Co. and subsidiary companies

## Steel Pinch-Hits for Aluminum and Copper

• • • American steel is saving 279,000 tons of aluminum and copper by pinch-hitting for these metals in a wide range of war weapons redesigned by Army ordnance, according to information made available to the American Iron and Steel Institute by the Ordnance Department of the United States Army. Revising specifications for countless ordnance items from tanks to bullet cores, ordnance engineers have converted a vast number of parts to steel so that 440,000,000 lb. of copper and 119,000,000 lb. of aluminum will be saved over the two-year period of 1942 and 1943. The Institute says steel shell cases when fully in effect on the production line will release 653,000,000 lb. of copper in addition to the savings made in tanks, artillery, etc.

announced net earnings of \$2,930,777 or \$1.80 a capital share for the three months ending Sept. 30. This compares with revised net earnings of \$2,608,409, equal to \$1.60 a capital share for the same period last year. For the nine months ending Sept. 30, net earnings were \$8,738,431 or \$5.35 a capital share as compared with net earnings of \$8,079,890, or \$4.95 a capital share for the same period of 1942.

With full production being maintained, hope was expressed by E. L. Ryerson, board chairman, that fourth quarter operating results would compare favorably with the preceding 1943 periods. Directors authorized purchase as of Oct. 1 of \$3,000,000 face value of the company's first mortgage sinking fund 3 per cent bonds due in 1961 at a price of 106 per cent of principal amount.

It was announced that renegotiation with government agencies had shown no excessive profits realized by the company during its fiscal year ended Dec. 31, 1942.

Despite construction delays, half of the coke ovens being built by the company for the Defense Plant Corp. are now in production and it is anticipated that the balance of the ovens and one blast furnace will go into operation during November.

**Wheeling Steel Corp.** and subsidiaries for the third quarter reported net profit of \$543,165, equal to 68c. a share on the common stock, comparing with \$839,659, or 68c. a share, in the 1942 period. For nine months ended Sept. 30, net profit was \$3,133,566, against \$2,835,307 in the 1942 period.

**National Steel Corp.** disclosed net earnings of \$3,199,612 or \$1.45 a share for the quarter ended Sept. 30. This compares with \$2,838,884, or \$1.29 per share in the like period of 1942. Earnings for the first nine months of this year, after provision for Federal taxes, amounted to \$8,418,477 compared with \$8,265,166 in the 1942 nine-month period.

**Rustless Iron & Steel Corp.** reported net profit of \$1,864,271, or \$1.94 per common share, after \$5,409,000 tax charges and \$150,000 provision for post-war adjustments and other contingencies, against \$1,887,425, or \$1.96 a share last year, when \$5,156,000 was provided for taxes.

**Carpenter Steel Co.'s** reported third quarter earnings amounted to \$303,374, after taxes and a \$300,000 reserve for post-war adjustment of inventories and other contingencies, compared with \$352,261 after a similar reserve in the 1942 period.

**Alan Wood Steel Co.** and subsidiaries reported third quarter net income of \$143,584 after provision for estimated Federal and state taxes. For the nine-month period ending Sept. 30 a net income of \$430,935 is reported compared with \$519,044 for the corresponding period of 1942.

**Superior Steel Corp.** reports a net profit of \$134,410, or \$1.19 a share, for the third quarter, compared with \$211,237, or \$1.86 a share, a year ago. For nine months ended Sept. 30 net profit was \$488,882, or \$4.32 a share, against \$455,094, or \$4.02 a share, in the 1942 period.

**Keystone Steel and Wire Co.'s** net income for third quarter was \$236,152 or 31c. per common share, compared with \$191,576, or 25c. per share in the 1942 third quarter. Net sales are reported at \$4,606,937, compared with \$3,650,573 in 1942.

**Simonds Saw & Steel Co.** for the nine months ended Sept. 30 showed a net income of \$1,228,435 or \$2.47 per share after allowance for Federal taxes and other contingencies. Net sales for the nine months were \$21,794,970, compared with \$19,871,301 for the like 1942 period.

**M. A. Hanna Co.'s** consolidated net income, after all charges including interest and provision for Federal taxes, is reported at \$1,113,477 for third quarter, compared with \$1,080,307 in the 1942 corresponding quarter. Net income for the nine month period amounted to \$2,998,805 compared with \$2,915,036 in the corresponding period last year.

**Bliss & Laughlin, Inc.,** reported net profit of \$525,972 for the nine months ended Sept. 30. This was equal to \$1.95 a common share,

and compared with a net profit of \$435,431, or \$1.61 a share, for the first nine months of 1942.

Buffalo Forge Co. and subsidiaries announced net profit after taxes, but before renegotiations, of \$319,170, equal to 98c. a common share, for the third quarter, compared with \$278,693, or 86c. a share, in the corresponding period of 1942.

#### Production Records Set by Youngstown Sheet & Tube Co.

Four new monthly production records were set by Youngstown Sheet & Tube Co., during September, three

at the Campbell works and one at Brier Hill. At the Campbell works the sintering plant topped by 526 tons a previous record made in May, 1943; the No. 2 seamless furnace surpassed by 2394 tons its April, 1943, record; and the combined seamless furnaces produced 2166 tons more to beat a previous record established in October, 1941. The Brier Hill works plate mill shearing department surpassed by 1375 tons a previous record made in June, 1943.

#### Rotary Electric Steel to Atlas

The Rotary Electric Steel Co. of Detroit, has been acquired from W. H. Colvin Sr. and associates for an undisclosed consideration by the American Co., subsidiary of the Atlas Corp. This was announced by Floyd B. Odum, Atlas president, who said operations would continue under the same management with the same organization. W. H. Colvin, Jr., will continue as president.

## Milestones: Inland, Ferracute, Elwell-Park Mark Eras

Inland Steel Co. this week celebrates its 50th anniversary. Joseph Block founded the firm in the midst of the 1893 business panic. Inland has since developed into a completely integrated steel producer with ingot capacity of close to 3,500,000 tons a year.

By the first decade of the 20th century, the organized group had parlayed 40 carloads of miscellaneous machinery originally erected at Chicago Heights, Ill., into a 20,000-ton mill at Indiana Harbor, Ind.

In the succeeding era of competition, the Chicago independent girded itself by purchase of the Laura iron ore mine in the Mesaba, a blast furnace, and coke ovens. During the first world war a fleet of ore boats was acquired, followed in more recent years by the purchase of limestone quarries, coal and fluorspar mines.

Increased outlets for Inland products were secured when Joseph T. Ryerson & Sons Inc. became a subsidiary in 1935, and with the acquisi-

tion of Milcor Steel Co., Milwaukee, the following year. In 1939, Wilson & Bennett Mfg. Co. was purchased. Concurrently with these acquisitions Inland expanded its production facilities.

Ferracute Machine Co., of Bridgeton, N. J., celebrated its 80th anniversary on Oct. 23. Over 1000 employees and guests assembled at the Ferracute Club and joined in an inspiring observance of the milestone. John B. Lawson, vice-president, presided.

George K. Bass, president, presented a watch to Henry A. Janvier, recently retired vice president, in recognition of 66 years of service. Seven other retired Ferracute men, including Percival H. Smith, son of the founder, Oberlin Smith, were honored. Service awards were given to a group of four employees with records of 50 years and over and another group of 24 employees with records of 25 years and

over. An industrial exhibit showing work produced on Ferracute presses was a highlight of the celebration.

At the close of its first 50 years in business, the Elwell-Parker Electric Co. of Cleveland has published a volume which reviews the concern's development since 1893. Entitled "Lengthened Shadows," the book covers the growth of the company, and, to a considerable extent, that of the industrial truck industry after 1906.

Although the Cleveland organization has been in existence continuously for 50 years, the story reaches back to the birth in 1843 of Thomas Parker, one of the founders of the electrical industry in Great Britain. The old firm of Elwell-Parker, Ltd., made motors and dynamos in Wolverhampton, England, and in 1893 licensed a separate company to build them in America.

After 1910 the company turned seriously to the development of interior trucks for industrial uses.

CONFERENCE: Representatives of Henry Disston & Sons, Inc., who attended the Disston War Conference held in Philadelphia, Oct. 4 to 10.



AFTER 66 YEARS OF SERVICE with Ferracute Machine Co., Bridgeton, N. J., Henry A. Janvier is retiring. Here he receives congratulations from Capt. Alvin Grauer (right) and Capt. Bernard A. Ben- nick.



# PARISH

## METAL STAMPINGS



MODERN  
DESIGN  
AT  
LOW COST



### HOUSEHOLD APPLIANCES

New refrigerators, cabinets, bathtubs, stoves, and a wide range of other household necessities will be a joy to the post-war housewife.

Pressed Metal Parts and stampings will make possible unparalleled efficiency, smart beauty, long life,—all those qualities that lower sales resistance in a competitive world.

No other method provides all characteristics required,—resistance to elements, ability to take hard knocks in every day use, relative low cost, tensile strength, beauty and so forth. Parish Pressed Steel has completely rounded facilities; engineering cooperation in the drawing board stage, all sizes of presses for most efficient production, welding facilities, painting and finishing departments, and full assembly facilities.

It is not too early to plan your new designs. We are ready to work with you in the preliminary stages.

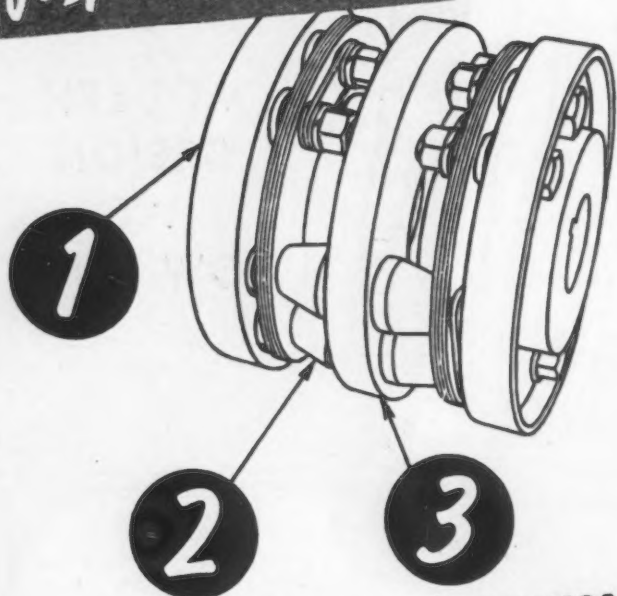
[[ And as our contribution to post-war progress, we are now equipped to stamp, fabricate, and heat treat aluminum, in addition to steel. ]]



PARISH PRESSED STEEL CO., Reading, Pa.  
Subsidiary of SPICER MANUFACTURING CORP.

Western Representative: F. Somers Peterson, 57 California St., San Francisco, Cal.

## 3 REASONS FOR

*Dependability*

## THOMAS FLEXIBLE COUPLINGS

- ① NO BACKLASH
- ② NO WEARING PARTS
- ③ NO LUBRICATION

Back-lash shocks and vibrations are the destructive fatigue forces that take annually in maintenance, millions of dollars in toll from the industries. This terrific drain, however, is greatly lessened by the adoption of Thomas Flexible Couplings, the modern non back-lash, vibration-free coupling.

Long ago Thomas Flexible Couplings enlisted for national defense and are now taking a vital part in winning the war. Write for our catalog (on your letterhead) to see how Thomas can solve your coupling problems.

THOMAS

THOMAS FLEXIBLE COUPLING CO.

WARREN, PENNSYLVANIA

Quotas Raised for  
Cast Iron Ware

••• Increased production of cast iron skillets, kettles, dutch ovens and flat irons for household, institutional, commercial, government, export or any other use was permitted Oct. 22 by WPB in a revision of Order L-30-e.

The revised order permits an increase in the amount of cast iron which manufacturers may use in the production of specified articles. Each manufacturer calculates his quarterly quota allowance by taking the percentage shown in the table below for an article and multiplying it by one-fourth of the amount of iron and steel he used for that article during the base period (July 1, 1940, to June 30, 1941). The specific quotas are:

Skillets .....	increased from 50 to 150 per cent
Household kettles .....	increased from 50 to 75 per cent
Sugar or wash kettles (16 gal. capacity) .....	increased from 25 to 100 per cent
Butchering kettles (30 gal. capacity) .....	increased from 25 to 100 per cent
Dutch ovens .....	increased from 50 to 100 per cent
Sad irons or flat irons ..	increased from 50 to 160 per cent

**FOUR HOUR SHIFT:** One of hundreds of professional and white collar workers who do four-hour shifts in war industries in Berkeley, Cal., after putting in a full day at the office or store. The worker is helping to clean up at the close of the day's pouring at H. C. Macaulay Foundry Corp.



# *Rust* CAN'T TOUCH HARPER BOLTS



**H**ARPER Fastenings resist rust, corrosion, salt laden air and other deep sea troubles. They're made of non-ferrous and stainless alloys. Today they are doing Trojan duty on battle ships, cruisers, aircraft carriers, PT boats, landing boats, submarines and many other types of vessels.

Because they are rust and corrosion resistant, Harper fastenings withstand severe

conditions in the chemical, food, utilities and numerous other industries. In the proper alloys they are non-magnetic, non-sparking, repeatedly removable and have other sterling properties.

## 4320 STOCK ITEMS

... of bolts, nuts, screws, washers, rivets and accessories in the non-ferrous and stainless alloys.

**THE H. M. HARPER COMPANY, 2607 Fletcher Street, Chicago, Illinois**

BRANCH OFFICES: 45 West Broadway, New York City 7 • 1442 Broad Street Station Bldg., Philadelphia 3 • 332 I. N. Van Nuys Bldg., Los Angeles 14 • 2nd National Bank Bldg., Houston 2, Texas • 800 Broadway, Cincinnati 2, Ohio • 739 N. Broadway, Milwaukee 2, Wis. • Representatives in Principal Cities.

*Brass*  
*Bronze*  
*Copper*  
*Everdur*  
*Monel*  
*Stainless*

# HARPER

EVERLASTING FASTENINGS





## HOLTITE-Phillips RECESSED HEADS SCREWS and BOLTS

*Cut Fastening Time*

up to  
**50%**  
and more

### ASSEMBLING OPERATIONS

can be done with  
*Speed, Safety and Efficiency by-*  
**WOMEN and all GREEN HANDS**

HOLTITE-Phillips Recessed Head Screws and bolts provide the safest, most efficient method of accelerating assembly operations. These modern fastenings can be hand driven or power driven by inexperienced women workers and all green hands. Basic training time is cut to a minimum and production increased without hazards of injuries, work spoilage or burred heads. Driven by experienced workers, HOLTITE-Phillips screws and bolts reduce fastening time and costs up to 50% or more.

Another great saving in production time is effected when Speed Nuts are used with HOLTITE Sheet Metal Screws in place of machine screws. The small tapered point permits the nuts to be run on with a much quicker start, and the smooth, faster lead threads further reduce turning time.

Used in sheet metal, castings, plastics, these "Thread-Forming" screws eliminate tapping operations by cutting their own threads in the material as they are driven in.

Check your fastening operations NOW—it will pay you, and it's patriotic to adopt these production time-savers.

## Specials

With complete, modern equipment, laboratories and facilities for producing Special fastenings and parts we can meet efficiently all requirements exact to specifications.

Each order is studied in our laboratories to determine the most suitable metal, heat treatment, finish and all other elements of fabrication upon which successful performance depends. Send blueprint, specifications or samples for estimate.



**CONTINENTAL  
SCREW CO.** New Bedford, Mass. U.S.A.  
*BUY MORE WAR BONDS*

## New WPB Forms

WPB-2449—Commercial and industrial refrigeration and air conditioning machinery and equipment.

WPB-1714—Application for approval of sale or other transfer of new light aircraft under Limitation Order No. L-48.

WPB-2713—Light power-driven machinery and tools: Manufacturer's monthly report of shipments, orders and inventory.

WPB-1047—Cranes, hoists, and monorail systems: Manufacturer's monthly report of shipments and orders.

WPB-931—Compressors, reciprocating: Application for authorization to purchase.

WPB-1263—Office machinery: Manufacturer's monthly report of production, shipments, inventory, and unfilled orders.

WPB-1688—Office machinery: Application to purchase or rent new and restricted used.

WPB-2934—Ferro-alloys required for melting schedule. Monthly.

WPB-2933—Alloy steel melting schedule. Monthly.

WPB-1974—Cadmium: Allocation certificate and authorization to use.

WPB-1722—Steel warehouse monthly report of armoured stock. Monthly.

CMPL-224—Authorization to begin construction and allotment of controlled materials.

CMPL-224-A—Amendment to authorization to begin construction and allotment of controlled materials.

WPB-809—Liquefied petroleum gas equipment: Application for authorization to install.

CMPL-201—Allotment decrease.

CMPL-200—Allotment increase.

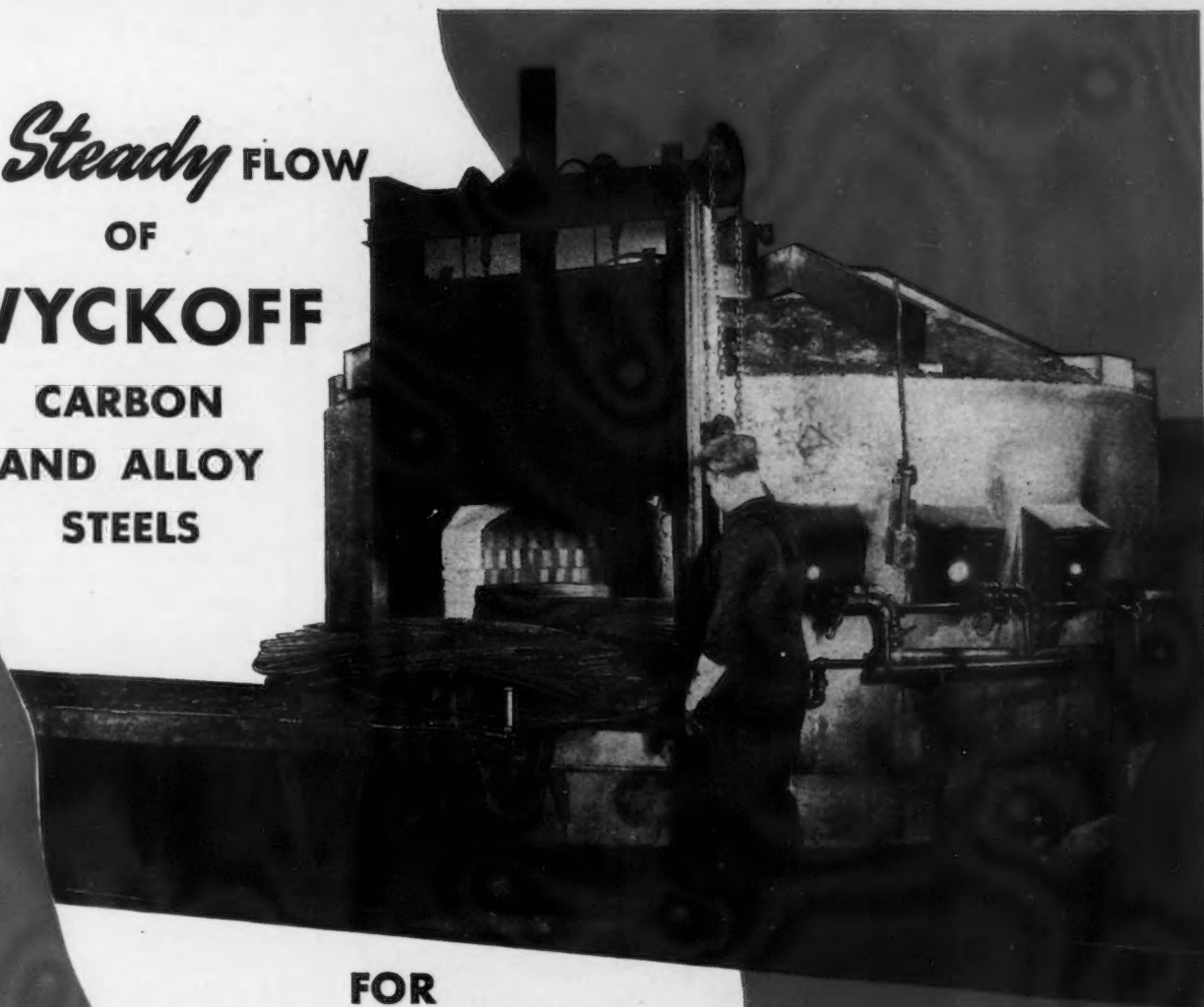
WPB-39—Manufacturer's monthly report of shipments, orders, and finished inventory of cutting tools. Monthly.

**SWING SHIFT TEAMMATES:** Glenn Olson, 6 ft. 5 in. tall, and Lewis Kroll, 4 ft. 4 in. tall, are swing shift partners at the Des Moines, Iowa, Ordnance Plant. Kroll pushes bullet buggies to Olson,



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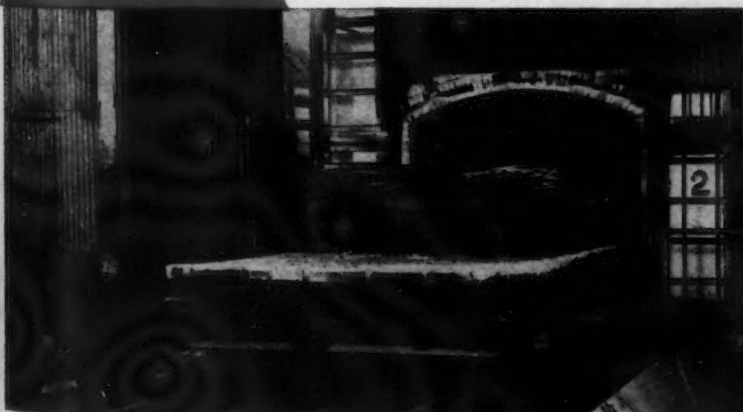
**A *Steady* FLOW  
OF  
WYCKOFF  
CARBON  
AND ALLOY  
STEELS**



**FOR  
AMERICA'S "PUSH-ON"**

Tons after tons of Wyckoff Special Furnace Treated Steel flow continuously to form America's fighting tools and equipment,— with no compromise in precision, accuracy or uniformity!

Wyckoff facilities that now serve 100% Uncle Sam's war effort, will be ready to serve you faithfully and dependably after our present war job is satisfactorily accomplished.



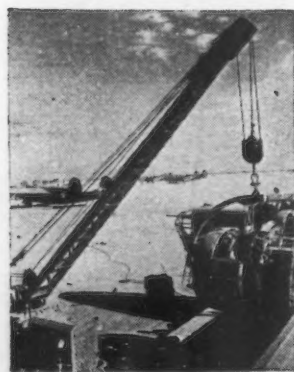
**WYCKOFF**  
**DRAWN STEEL CO.**  
First National Bank Bldg.  
PITTSBURGH, PA.  
3200 So. Kedzie Ave., Chicago, Ill.



(Official U. S. Navy Photo) Roustabout Cranes are hustling war materiel at home and overseas.



Roustabout Crane handling U.S. 1000 pounder bombs in Britain. (Official Signal Corps Photo).



Roustabout Crane puts motor in place on Liberator Bomber at Consolidated Vultee's San Diego plant.

Free-Roving  
Tractor-Footed  
**ROUSTABOUT  
CRANES**

## help win the Big Scrap more quickly

**R**OUSTABOUT CRANE'S handling, stacking, loading speed and versatility—now widely serving armed forces, war plants, air fields and transport organizations—promise you new efficiency and lower costs after the war. For these powerful load-hustlers, on wheels or crawler tracks, are *where* you want 'em *when* you want 'em, preventing delays, keeping things moving, bulky stuff to 5 tons. Easy to operate, all tractor power, full swing boom on ball-bearing turntable; gears in oil—built for years of overwork. For fast action now, for post-war cost cutting, write for the Roustabout Crane story.

THE HUGHES-KEENAN CO.  
571 Newman Street, Mansfield, Ohio



**ROUSTABOUT CRANES**  
By Hughes-Keenan

Load-Handling Specialists Since 1904

## Foundry Injuries Increased in 1942

• • • The 1942 injury rate of the foundry industry recorded an average frequency of 22.49 reportable injuries per million hours worked, according to the National Safety Council. Severity rates averaged 1.66 days disability per 1000 hours worked. Injury rates averaged 2 per cent higher in frequency and 22 per cent higher in severity than in 1941. Small foundries had the highest 1942 frequency rates, averaging 32.96. Severity rates, however, averaged about the same in large and small units. The frequency rate for deaths was up sharply in comparison with the 1941 rate.

## AA-1 Rating Permitted On Processing Furnished Steel

Washington

• • • CMP Regulation No. 8 was amended recently by WPB to permit steel producers operating under paragraph d-1 of that regulation to apply an AA-1 rating on orders for the processing of steel he furnishes to others to be processed for him into the same or another controlled material form. To apply this rating order must be endorsed with the rating AA-1 followed by the symbol X-1 with the form of certification described in CMP Regulation No. 7.

**FUEL DRUMS** stretch out row upon row besides this Naval Air transport plane at an airport in Brazil, one of the many spots on five continents linked by the U. S. Navy's own air line.



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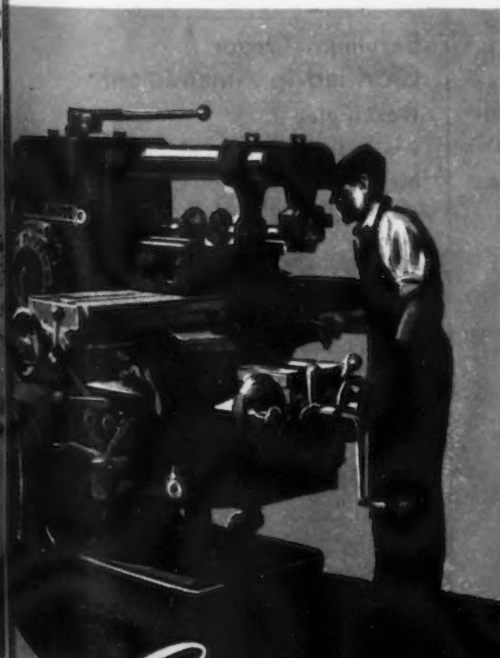
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## A CHALLENGE TO AMERICANS "WHO GET THINGS DONE"



*Milwaukee*

Right now we are up against the hard, blunt facts of war and the grim necessity of winning it. It's the one thing that matters with no alternative but complete and final Victory.

At the same time, it's only natural to wonder about the future—to think about the time that is coming after the last shot in this conflict is fired. And you can be sure that the future will be a challenge. We won't just slip back to the world we knew before hell broke loose.

For winning the peace will call for just about as much all-out effort as all-out production does now to win the war. We will have to do something with our tremendous productive capacity—our vast industrial plants—our skilled workers.

Yes, it will be a challenge to American business ability, the kind of a challenge Americans "who get things done" like—a challenge of their capacity to organ-

ize—manage—produce. It will be a new industrial age, an age of new materials, new techniques, new precisions. Supplying the needs of that future will take all that industry can produce and deliver.

Kearney & Trecker Corporation sees that kind of an America in the years after the war and is making its plans accordingly. No matter how long and hard the fight—it's worth it for the America of tomorrow.

**KEARNEY & TRECKER**  
CORPORATION  
Milwaukee Wisconsin



**KEARNEY & TRECKER**  
CORPORATION

"Buy Victory with War Bonds"

**M A C H I N E T O O L S**



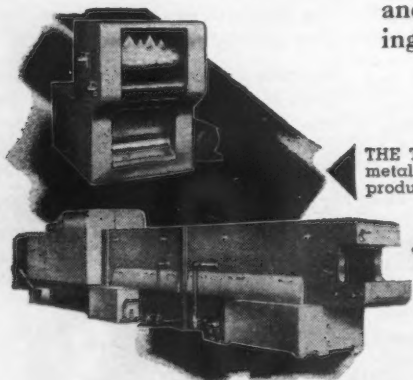
## THE NEW TABL-SPRAY

HERE is the practical answer to the metal washing problem that requires fast cleaning of flat, fragile or intricate pieces that cannot be handled in other equipment because of scratching, breakage or inefficient washing.

When large-scale production is not a requirement this machine will quickly pay for itself because of its low initial cost and the thoroughness of its cleaning.

The Tabl-Spray cleans quickly and effectively because of the complete exposure given to all parts by rotating them through the path of well-positioned power-sprays. Large and small parts receive a rapid cleaning from all directions.

For further information  
write for Bulletin 19.



THE TUMBL-SPRAY MACHINE for cleaning metal parts, stampings, and screw machine products. Write for Bulletin No. 9.

THE CONVEYOR-SPRAY MACHINE for washing, rinsing and drying miscellaneous work in one continuous operation.

METAL WASHING DIVISION



**American**  
FOUNDRY EQUIPMENT CO.

510 SOUTH BYRKIT STREET

MISHAWAKA, INDIANA

### New Resins Will Release Shellac Stores

• • • Industrial chemists co-operating with WPB and Navy experts have developed several types of synthetic resin which will replace shellac for leading uses. Production of these resins has reached such sufficient volume that the Navy has transferred its large holdings of shellac to the Defense Supplies Corp. to be available to other departments for war purposes.

In consequence, it is anticipated that larger quantities of shellac will be made available to industries which require this material to fill Army and Navy contracts.

### WPB Narrows Scope Of M-9-C-4; Alters Copper Use

Washington

• • • WPB issued supplementary order M-9-C-4 as amended, changing the status of various copper articles. The amended order is no longer applicable to copper or copper base alloy pipe, cubing or fittings in a building or structure, unless the installation is for plumbing, heating or cooking purposes. Under the narrowed scope of the order it will not be necessary under any conditions for the Copper Division to pass on the installation of air-conditioning, refrigeration or industrial processing systems. The amended order also prohibits contractors from using copper or brass nails, screws, nuts, bolts, rivets, washers and expansion shields for construction and repair to buildings.

### Beryllium Order Clarified in Amendment

Washington

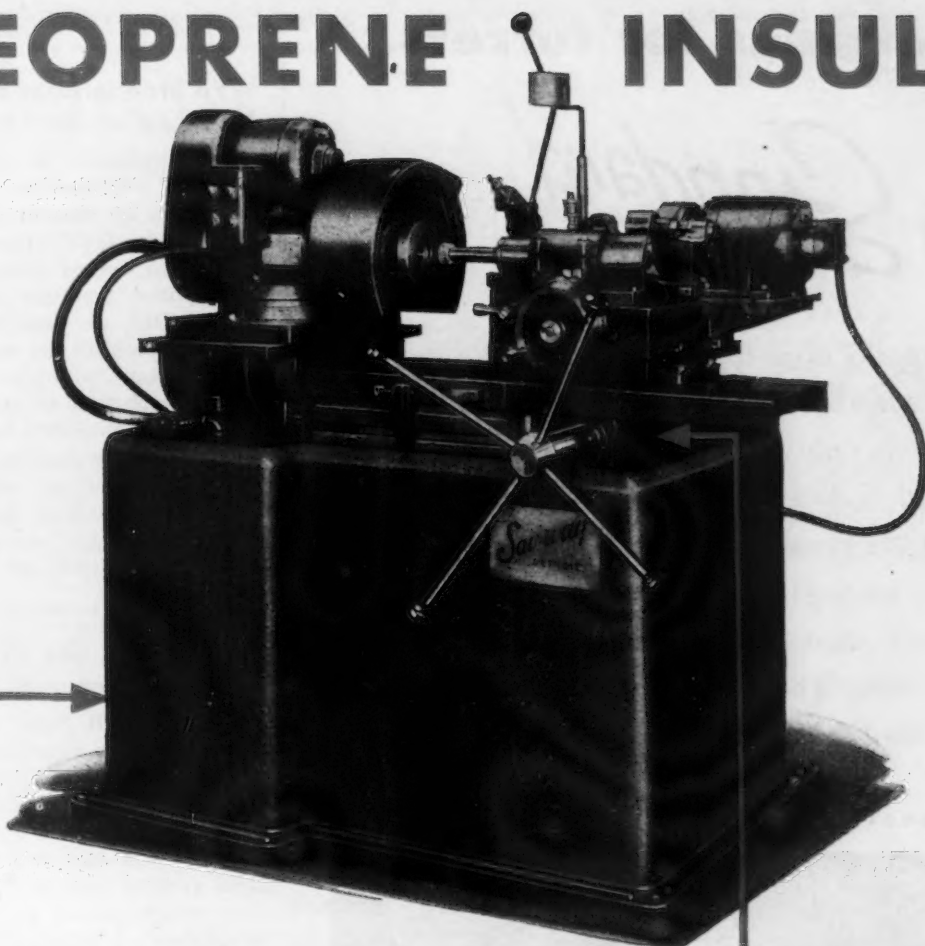
• • • For purposes of greater clarity in the definition of beryllium, WPB has issued General Preference Order M-16, as amended. No fundamental changes have been made in the original order as amended Aug. 24, but it has merely been reworded to prevent any possible ambiguity as to the meaning of an alloy.

Thus subparagraph (v) has been redesignated as subparagraph (iv) and reads:

"Any alloy made for resale in ingot form and containing less than 3 per cent but not less than 0.1 per cent by weight of the element beryllium, if made in whole or in part from scrap or secondary materials."

Also new WPB form numbers are substituted for old PD form numbers in the amended order.

# NEOPRENE INSULATED



## against Vibration, Distortion, Misalignment!

This radical departure from conventional design gives the Sav-Way multi-purpose internal grinder a new permanence of alignment and resulting higher accuracy. The bed proper is a thick surface-plate type normalized alloy iron casting of heavily ribbed whale-back construction. Neoprene pads between the bed and the steel base eliminate metal-to-metal contact and absorb floor vibration, preventing distortion of the base being transmitted to the bed, which is accurately scraped. This is only one of seventeen specific features which make the new Sav-Way M-1-A Grinder outstanding in design and construction.

For complete description and specifications, attach the coupon to your letterhead.



Send the Coupon  
for Your Copy

KEEP AN EYE ON

**Sav-way INDUSTRIES**  
\* Machine Tool Division \*  
4875 EAST EIGHT MILE - DETROIT, MICHIGAN

SAV-WAY INDUSTRIES, 4875 E. 8-Mile Road  
Detroit, Michigan

Kindly send me a copy of the illustrated folder  
describing the Sav-Way M-1-A Internal Grinder.

Name

Position

Firm

Address

City  State

PRODUCERS OF SAV-WAY HAND AND HYDRAULIC INTERNAL GRINDERS • SAV-WAY GOLD  
REAL SPINDLES • PLUG GAGES • PRECISION AIRCRAFT AND AUTOMOTIVE PARTS

## Ring forgings for turrets

*by Standard*

Weldless ring forgings of many types have long been a specialty at Standard. The adaptation of this type of forging to the latest needs of war is only one example of the use of steel forgings by Standard in America's war effort. In peace as well as war, throughout 148 years of our Nation's history, Standard has supplied quality forgings as specified. Not only our armed forces but America's great railroads and industries as well, can attest their worth. The Baldwin Locomotive Works, Standard Steel Works Division, Burnham, Pa., U. S. A.

FORGINGS • CASTINGS • WELDLESS RINGS • STEEL WHEELS



## NEWS OF INDUSTRY

### WPB Standardizes on 10 Wheelbarrow Models

• • • Reduction in the number of models of wheelbarrows from 80 to 10 is effected by Schedule VII to Limitation Order L-157 (Hand Tools Simplification), issued recently by WPB.

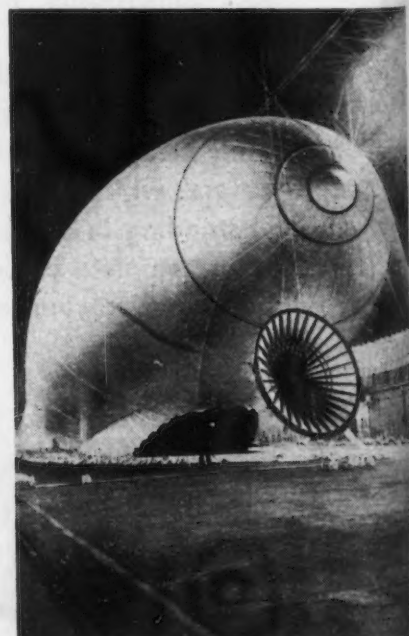
Simplified practices to become effective Dec. 21 established by the Schedule prohibit the manufacture of wheelbarrows with two wheels and limit manufacture of other wheelbarrows to the specifications set forth in Appendix A attached to the Schedule. Steel wheelbarrows must conform with the maximum capacities and weights, and the designations and gages of trays specified.

### WPB Urging Use of Rail Steel Concrete Bars

• • • The WPB Steel Division has again called the attention of claimant agencies to the availability of concrete reinforcing bars in considerable tonnage.

Reinforcing bars can be fashioned from rerolled rail steel or discarded steel which cannot be used for the production of many essential steel products, John T. Whiting, Director of the Steel Division, pointed out. This subject has been reviewed by the Carbon Steel Bar and Rail Steel Bar Industry Advisory Committees.

**NAVY SUPER-BLIMP:** A nose cone hangs ready for placement on the envelope of the Navy's newest and largest non-rigid airship now being test flown at the plant of the Goodyear Aircraft Corp., Akron.



# BANKING SERVICE FOR THE JOB AHEAD

SINCE no man can foresee how long the war will last, it is apparent that industrial management is faced with a two-fold problem. First is the paramount necessity for maximum war production to meet the needs of the armed forces. As Under-Secretary of War Patterson recently said, "*The most difficult job of all lies ahead—the drive to victory.*"

Second only to meeting these vital war-production goals is the job that lies ahead in projecting plans for reconversion or production for civilian use. This job also must be faced now, if maximum post-war employment is to be assured for those at home and for the fighting men when they return.

In meeting maximum production goals, in adjusting production to changing war demands, and in planning for peace-time operations, there are many problems that require banking service. Officers of this Bank are prepared, through extensive experience in handling war-production loans and through practical study of post-war problems, to work with business executives in planning both present and future requirements. We cordially invite your inquiry.

## BANKERS TRUST COMPANY

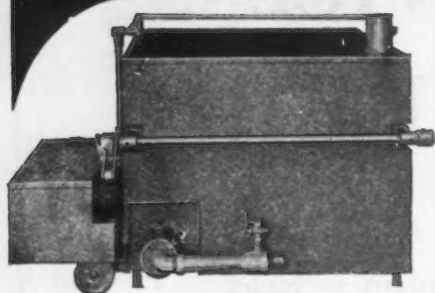
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YORK

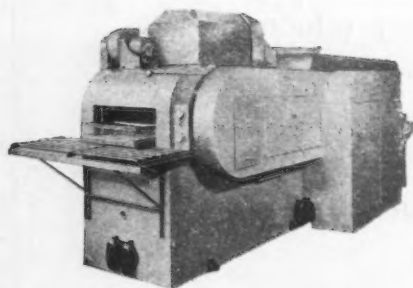
## METAL PARTS CLEANING

*Low Cost...Efficient*



### STURDY - BILT "Simplex"

A small, compact, mechanically simple unit combining ACTIVE-SOAK with WASHING ACTION. Removes oil, grease, chips from metal parts, assemblies, castings, etc. Can be installed individually in different departments or in a series for consecutive steps of cleaning, rinsing, coating or treating. Also the S-B DRYER for complete installation.



### STURDY-BILT "Soaker-Hydro"

A unit for positive, production line cleaning of metal parts, etc. Hot SOAKING PROCESS combined with powerful washing section. Equipped with a built-in Drying Unit and Chamber. Parts delivered properly cleaned and dried.

#### RECENT INSTALLATIONS:

American Lava Corp. (3) Chattanooga, Tenn.  
Imperial Brass Co., Chicago, Ill.  
Chain Belt Co., Milwaukee, Wis.  
General Motors Installations:  
Diesel Div., Detroit, Mich.  
Saginaw Gear Div., Saginaw, Mich.  
Delco Remy Div. (2) Anderson, Ind.  
Timken Bearing Corp.  
Wisconsin Axle Div. (4) Oshkosh, Wis.  
Aircraft Radio Corp., Wright Field, Ohio.  
U. S. Naval Air Training, Memphis, Tenn.  
McCulloch Eng. (Borg-Warner), Milwaukee, Wis.  
Western Electric Co., Clifton, N. J.  
Marlin Rockwell, Jamestown, N. Y.  
& Others

Send for complete details  
on either or both units

## STURDY-BILT

EQUIPMENT CORPORATION

Dept. IA-11 West Allis, Wis.

## Canada Issues New Copper Order; Relaxes Restrictions on Lead, Zinc

### Ottawa

• • • Order of the Canadian Metals Controller, No. M.C. 13-A of Sept. 1, 1942, has been rescinded, and order No. M.C. 13-B, dealing with copper wire bar, copper wire rod, copperweld wire rod and copper wire, substituted. Under the new order no person shall sell or supply or purchase or acquire any copper wire bar, rods, copperweld wire rod or wire, except as authorized under provisions of this order. Each person who desires to purchase copper materials as above designated for further processing into other forms of copper wire, shall forward his purchase order to the Metals Controller, together with an application to purchase. If approved the purchase order will be so marked and forwarded to the designated supplier and it then may be filed.

Each person who desires to purchase copper wire (except for further processing) in excess of 1000 lb. in weight shall forward his purchase order to his supplier, together with an application to purchase, and the supplier shall in turn submit the purchase order and the application to the Controller. If the supplier would not be filling the customer's order from his stock, he also shall forward his own purchase order for the material required, endorsing his purchase order on the customer's application to purchase.

A supplier may sell or supply copper wire in amounts not exceeding

1000 lb. to any authorized purchaser of the naval, army or air service.

C. D. Howe, Minister of Munitions and Supply, announced a new order, which relaxes the restrictions on the use of zinc and lead.

The new order raises from 50 to 65 per cent the zinc quota for zinc oxide in paint manufacture, allows the galvanizing of pipes up to and including three inches in diameter, and makes adjustment in other zinc quotas.

A new order by Metals Controller G. C. Bateman abolishes the permit requirement for purchases of pig or ingots of lead and confines inventories to 60 days' normal supply.

With stocks of metals widely used in the war effort built to satisfactory levels the Canadian metal situation, as well as that of the United Nations, has shown general improvement in recent weeks.

Recently there has been an obvious change in the attitude of the Canadian and the United States governments toward new sources of war metals. There is not the same urgency to find and develop new mines in Canada, except insofar as it may be necessary to meet exhaustion of present sources of supply.

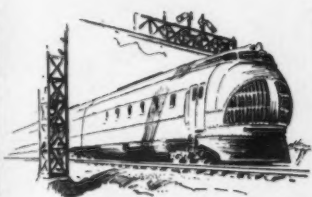
It is reported that new sources of imported alloy metals have resulted in the establishing of satisfactory reserves. Cobalt, tungsten, manganese and chrome have been mentioned in this regard.

### SUPPLY "DUCKS": American amphibious craft help unload Liberty ships near Licata, Sicily, taking the material straight to the inland dumps.

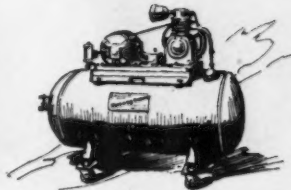


# ARE PARTS A PROBLEM?

*Consider BRAKE SHOE as a Source*



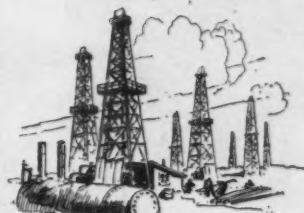
Parts for Trains



Equipment for Garages



Parts for Excavating



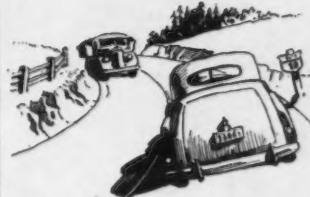
Parts for Oil Drilling



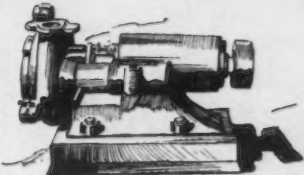
Parts for Planes

Parts in metals,  
metal alloys and com-  
position.

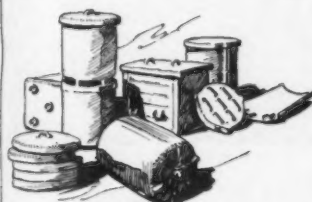
Parts that are cast,  
upset, drop forged and  
molded.



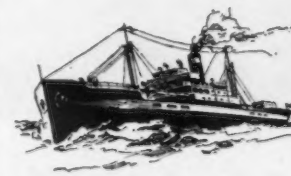
Parts for Cars, Trucks



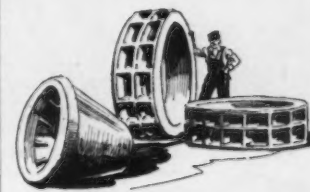
Industrial Pumps



Parts for Heat Treating



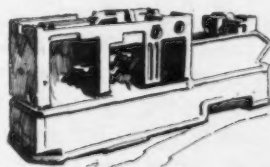
Parts for Ships



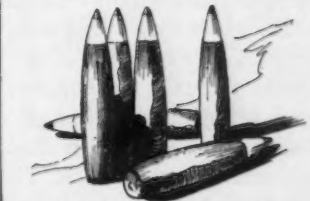
Parts for Crushers

Whether your "pun-  
ished part" problem  
requires one casting  
or thousands of steel  
forgings, BRAKE SHOE  
is equipped to serve  
you.

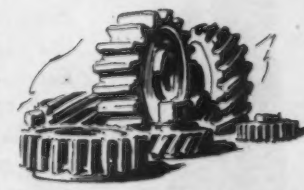
ENLIST your dollars  
for Victory — Buy  
more WAR BONDS  
today.



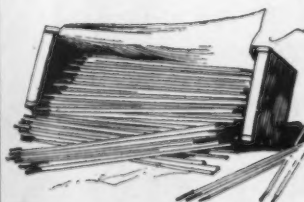
Parts for Machinery



Parts for Shells



Parts for Manufacturers



Products for Welding

AMERICAN BRAKE SHOE COMPANY, 230 PARK AVE., NEW YORK 17, N. Y.

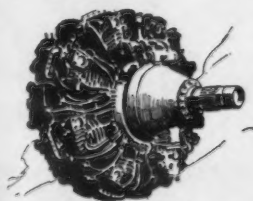


58 PLANTS SERVING INDUSTRY AND TRANSPORTATION

American Brakeblok Division . . . . . Detroit, Mich.  
Ramapo Ajax Division . . . . . New York, N. Y.  
American Manganese Steel Division Chicago Heights, Ill.  
Brake Shoe & Castings Division . . . . . New York, N. Y.  
Kellogg Division . . . . . Rochester, N. Y.  
American Forge Division . . . . . Chicago, Ill.  
Southern Wheel Division . . . . . New York, N. Y.  
National Bearing Metals Corp. . . . . St. Louis, Mo.



Parts for Landing Gears



Parts for Aircraft Engines



Parts for Tanks



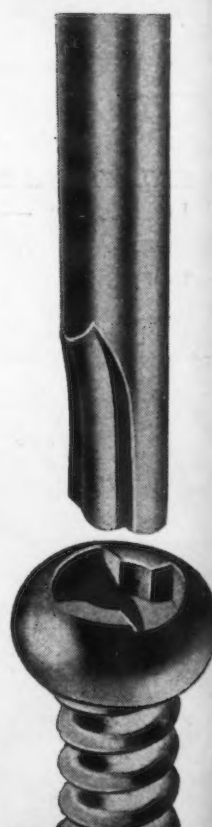
## *This Farmer Would Laugh*

if he were asked to send his dull blades back to the factory for reconditioning. He has a way of his own. Equally simple and economical is the restoration of original efficiency to the Center Pivot Assembler's Bit used with **CLUTCH HEAD** Screws. A brief application of the end surface to a grinding wheel is all that is needed to send it back to the Line with a new lease on life . . . ready again for another long spell of uninterrupted service. This is an important factor in time and money saving on assembly lines. Yet, *it is just one of several exclusive CLUTCH HEAD features* that contribute to faster, better, safer, and lower cost production. The wide roomy clutch invites confidence for higher speed . . . even with "green" operators. Natural self-centering entry removes the hazard of slippage. Vertical clutch walls reduce the driving effort required. The Lock-On feature, uniting screw and bit as a unit for easy one-handed reaching, eliminates dropped screws and fumbling with "mechanical" fingers. Add to these, the fact that **CLUTCH HEAD** is the only modern screw operative with ordinary types screwdrivers . . . so important to service and adjustments in the field.

**CLUTCH HEAD** Screws, used today in important wartime work, are available in Standard and Thread-forming types for every purpose. Their production is backed by the extensive resources of this Corporation and by responsible Licensees.



So that you may get a first-hand understanding of these many advantages, United invites you to send for an assortment of **CLUTCH HEAD** Screws and sample Center Pivot Assembler's Bit . . . also fully illustrated Brochure.



**UNITED SCREW AND BOLT CORPORATION**  
CHICAGO CLEVELAND NEW YORK



## "GREEN HANDS FROM SCHOOLS COULDN'T BURN TOOLS"

Quotes POR-OS-WAY'S  
War Plant Reporter  
from Interview

Dear Charlie:

I'm at the ~~Superior~~ plant where they're using Por-os-way wheels to grind carbide-tipped tools free hand and dry. Even here they've boosted production over 40% and in their own words "green hands from training schools couldn't burn tools." In fact, they said the tools "hardly get warm". Cool action is the big thing in grinding carbide tools.

Be seeing you.  
Your roving reporter  
Vic

### THE JOB:

Grinding free hand and dry on Excello Tool Grinder carbide-tipped tools 1" x 1" x 6", for turning air-plane struts, shaping air-plane carburetors, shaping and turning gun turrets for planes.

**THE WHEEL:** Por-os-way  
10" x 2" x 2" C54KV3

*All facts and figures given are taken from an actual field survey made by a Por-os-way correspondent*

THE RECORD	POR-OS-WAY WHEEL	FORMER WHEEL
Number tools per hour per man	37	26
Number of dressings required	NONE	Every 2 hours
Pieces per wheel	888	520
Stock to be removed	.000"—.250"	same
Wheel life	24 hours	20 hours
Depth of cut	.002"—.010"	Tools burned when jammed into wheel
Number of passes required	12	48
Amount of rejects	0	50 per day (scrapped)
Increase in production	42.3%	



WRITE, for complete booklet "Facts About Por-os-way". The address is 434 Wheatland Street, Phoenixville, Pennsylvania.

# POR-OS-WAY\*

*a new*

## RADIAC\* PRODUCT

**2 TO 5 TIMES**  
MORE *WAR* PRODUCTION  
PER MAN PER MACHINE



**A. P. DE SANNO & SON, INC.**  
NEW YORK, CHICAGO, PITTSBURGH,  
CLEVELAND, DETROIT, LOS ANGELES



**PHOENIXVILLE, PENNA.**  
Western Gateway to  
VALLEY FORGE

\*T. M. Reg. U. S. Pat. Off.  
COPYRIGHT, 1943, A. P. de Sanno & Son, Inc.

## Letter Picturing Agonies of War Reproduced as a Poster by P & W

• • • The Pratt & Whitney Division of Niles-Bement-Pond Co., West Hartford, Conn., has reproduced in a large poster a letter received recently from a former employee as he lay recovering in a Navy bunk in the Southwest Pacific area. "Read the letter carefully. Take its full meaning into your heart," urges Clayton R. Burt, president and general manager, in a foreword on the poster. "Perhaps the stark realities that this boy paints in simple language may bring home to each of us the vital need for more work." The letter follows:

"Dear Dad:

"This letter is the result of my experiences of the past month in a hospital and on board the ———, and of reports I have been reading in current news magazines about war production and transportation difficulties back in the States. I believe that the people who are in any way responsible for these difficulties, the men who have mismanaged their businesses, the narrow-minded politicians and lobbyists who back national and labor union laws which slow production and transportation and aggravate the labor shortage, the men who strike for a few cents more per hour, the participants in race wars, anyone who is a party in these quarrels of society, should be sentenced to spend one month in a field hospital or on board a ———, near an active war theater.

"They should lie in a bunk and see a 17-year-old kid—son of a union leader from upper New York State—lying flat on a hard wood table with two broken arms and a broken back. They should have the privilege of feeding a Chief Petty Officer, a man who has spent years in the Navy and is counted among the most valuable personnel, who was blinded by a torpedo explosion. They should talk to the Lieutenant son of a government official who has a piece of shrapnel in one lung, and who knows that the other lung might carry him to a ripe old age, or that his life might expire at any moment. They should lie in the darkness and hear the cold blast of the Klaxon calling General Quarters—lie there with nothing to do but wonder if they are going to get you—again. They should be in a bed next to one of the few and much needed doctors who had both legs practically ripped off by shrapnel, see him receiving three quarts of blood plasma in as many days, watch his quiet suffering of pain, and finally when the pain has become unbearable and even morphine won't help, try to go to sleep, when with

each breath the doctor cries 'Oh God,' and every few minutes screams out a full sentence 'Why don't you cut off my legs' or 'Please throw me into the sea'—the next morning an empty bed and an attendant who said quietly 'He has passed into the painless land of peace.'

"Is the American public too soft to hear about this side of the war their husbands and sons are fighting? Surely if they realized that total war is more than the triumphant march of troops into a conquered city, more than a brief news account of a naval victory or a successful landing on an enemy held shore, they would insist that the minor quarrels within our society—and any quarrel is minor compared with the pain of the wounded and dying—wait until victory had insured the continuance of that society, and no one man or group of men could sway them from that conviction."

### 48-Hr. Week to Be Extended to Critical Areas

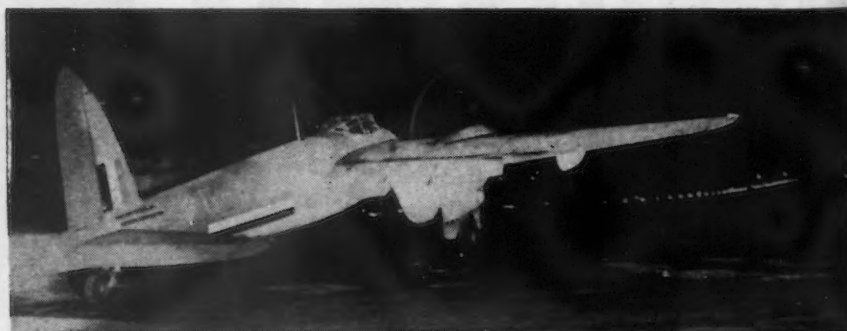
Washington

• • • The 48-hr. week will be applied before Nov. 15 in all areas where labor shortages have become acute, and within 30 days in all areas after they are brought into Group I—the group in which acute labor shortages have developed—Paul V. McNutt, chairman of the WMC announced.

Instructions concerning the extension of the longer work week sent by the commission's Bureau of Manpower utilization to all regional Manpower Directors also suggest the possibility of its application soon in areas where labor shortages have not yet actually developed. They call for consideration of the advisability of putting the longer work week in effect within 60 days in areas classified in Group II.

In the 71 areas now in Group I, the longer work week has been put in effect in 40. Of the 112 areas in Group II, the longer week is in effect in only 19. The industries to which the longer work week has been applied on a nation-wide basis are non-ferrous mining and smelting, and metals, logging, and iron and steel.

**NEW JOB:** The Mosquito fighter bomber has a new role in the war effort, that of a highspeed transport aircraft.



Greater Tonnage  
Per Edge of Blade

**A**

**AMERICAN  
SHEAR KNIFE CO.**  
HOMESTEAD · PENNSYLVANIA

# AMCO

*Continuous Recuperative*

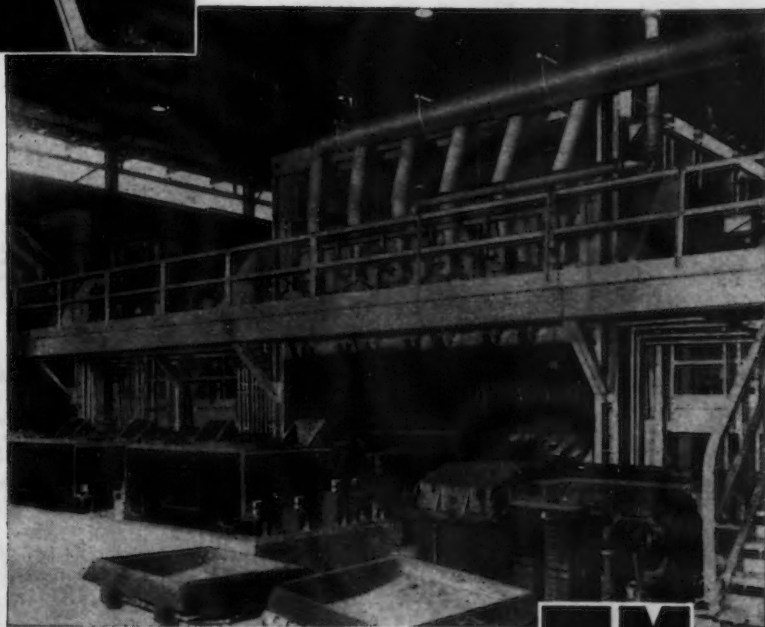
**SLAB AND BILLET HEATING FURNACES**

**Charging  
End-Fired**

***AMCO Continuous Slab  
Heating Furnaces and  
AMCO Pit Furnaces  
were selected to  
serve a large, new  
American Plate Mill***



**8 AMCO Pit Furnaces  
also installed**



**Amco Also Builds Open Hearth, Recuperative Side-Door Heating, and Heavy-Duty Forge Furnaces**

*The* **AMSLER-MORTON** *Company*  
FULTON BUILDING • PITTSBURGH, PA.



# HERE'S HOW YOU CAN "Get in the Scrap!"



This A-F Pan-Type Overlapping Beaded Apron Conveyor takes the scrap (via slides) directly from the stamping presses and conveys it out through the wall to a long reversing conveyor of similar construction, which, in turn, conveys the scrap to cars at one end—or to an inclined apron conveyor discharging into trucks at the other end of the line.

★ ★ ★ ★ ★

## ALVEY-FERGUSON SCRAP SALVAGING CONVEYORS HELP YOU TO MORE EFFICIENT SCRAP CONVERSION

**YOU KNOW** that scrap reserves are declining—and at an alarming rate. Scrap that is needed for vital war products. You've been asked by Uncle Sam to back up the Nation's Scrap Conservation Campaign. But how?

Here's the first really practical, efficient and economical method—the use of an A-F Scientifically-Planned Scrap Salvaging System especially adapted for your plant!

This photograph shows how the scrap is discharged directly into the cars for immediate shipment to scrap salvaging plants. No trucks are used. No manpower is wasted.

The bottom photograph shows how the A-F Portable Conveyor units carry the scrap discharged from the main conveyor directly to a trailer truck for movement to a steel mill. After one trailer truck has been loaded, scrap can be dumped into either of two other lined-up empty trucks.

... Other types of A-F Scrap Handling Conveyor Systems segregate important scrap—ferrous from non-ferrous, etc.—and dump each type of alloy into its own bin or carrier.

Whatever your scrap salvaging, material handling, and metal products cleaning and finishing problems—write us today.

**The ALVEY-FERGUSON CO.**  
719 Disney St., Cincinnati 9, Ohio

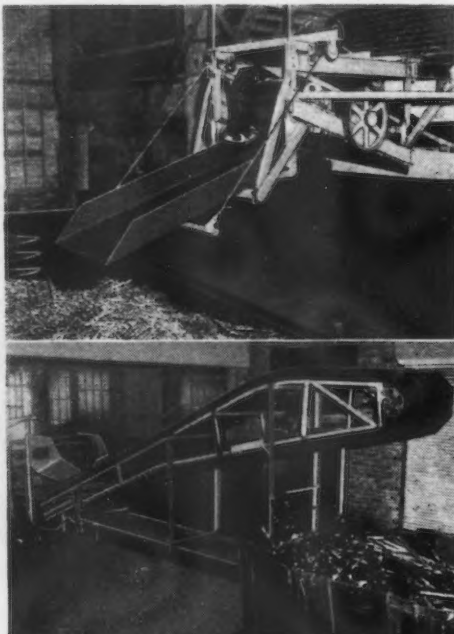
Affiliated Corporation

The Alvey-Ferguson Co. of California  
Slauson and Santa Fe Avenues  
Los Angeles, Cal.

★ ★ ★



★ ★ ★



CONVEYING EQUIPMENT



# Alvey-Ferguson

METAL PRODUCTS CLEANING & FINISHING EQUIPMENT

## WPB Appoints Two New Advisory Committees

Washington

... The War Production Board has announced formation of these Industry Advisory Committees:

### PRECISION TOOLS INDUSTRY

Government presiding officer: Franz T. Stone; Committee members: Frederick Blackall, Taft-Pierce Mfg. Co., Woonsocket, R. I.; S. H. Smith, Smith Tool and Engineering Co., Bucyrus, Ohio; W. J. Greene, L. S. Starrett Co., Athol, Mass.; Kenyon Y. Taylor, Millers Falls Co., Greenfield, Mass.; Paul R. Hatch, Brown & Sharpe Mfg. Co., Providence, R. I.; F. C. Tanner, Federal Products Corp., Providence, R. I.; A. Bradford Reed, Reed Small Tool Works, Worcester, Mass.; Robert G. Thompson, Lufkin Rule Co., Saginaw, Mich.

### METAL CUTTING TOOL INDUSTRY

Government presiding officer: Franz T. Stone; Committee members: C. W. Bettcher, Eastern Machine Screw Corp., New Haven, Conn.; E. H. Martindale, The Martindale Electric Co., Cleveland; W. E. Caldwell, The Cleveland Twist Drill Co., Cleveland; D. G. Miller, Greenfield Tap & Die Corp., Greenfield, Mass.; H. R. Conners, Detroit Broach Co., Detroit; Charles M. Pond, Pratt & Whitney, W. Hartford, Conn.; W. M. Dalzen, Dalzen Tool & Mfg. Co., Detroit; J. J. Prindiville, Jr., The Lapointe Machine Tool Co., Hudson, Mass.; Frank W. England, Illinois Tool Works, Chicago; Ernest C. Putnam, Putnam Tool Co., Detroit; Harry Fussner, The National Acme Co., Cleveland; W. G. Robbins, Carboley Co., Detroit; W. E. Loy Union Twist Drill Co., Athol, Mass.; J. S. Storrs, Tungsten Electric Corp., Union City, N. J.

### COATED ABRASIVE INDUSTRY

Government presiding officer: Franz T. Stone; committee members: George Balcom, Abrasive Products, Inc., South Braintree, Mass.; James Jackson, Midwest Abrasive Co., Detroit; A. G. Bush, Minnesota Mining & Mfg. Co., St. Paul; Charles Knapier, Carborundum Co., Niagara Falls; H. M. Elliot, Behr-Manning Corp., Troy, N. Y.; George Manning, Armour & Co., Chicago; E. B. Gallaher, Clover Mfg. Co., Norwalk, Conn.; Austin M. Porter, Wilmington Abrasive Works.

... WPB has announced formation

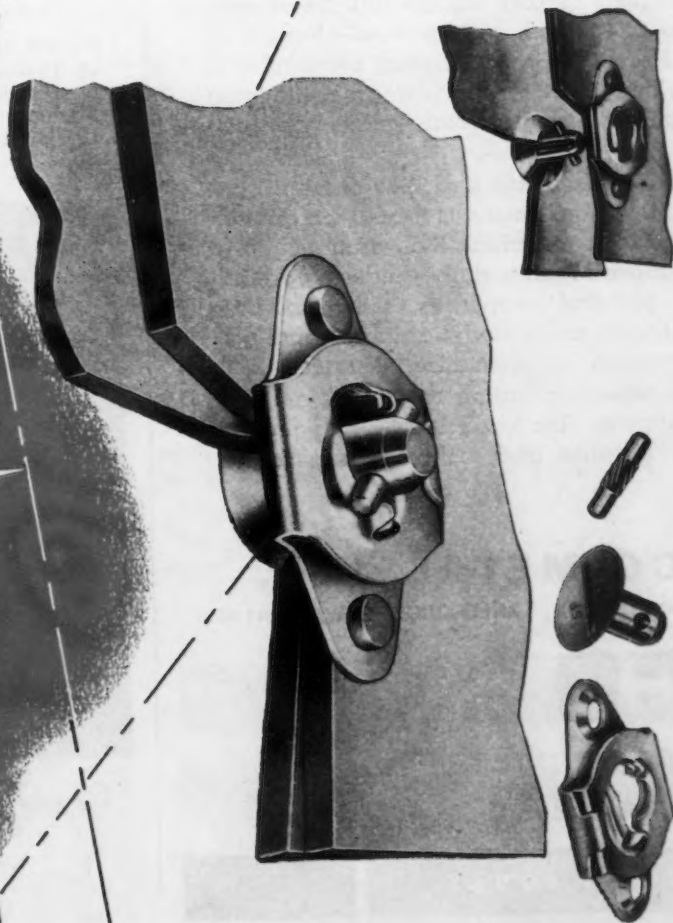
**AN OLD-FASHIONED AUTO HORN**  
on the PV-2 helicopter is demonstrated by Patsy Allison as Frank N. Piasecki, pilot, looks on.



# PRODUCT DESIGNERS

**THIS QUICK-OPENING FASTENER  
OFFERS IMPORTANT ADVANTAGES  
FOR YOUR NEW PRODUCTS!**

## SHAKEPROOF COWL FASTENERS



Fast, easy installation on metal,  
plywood or plastics.

Only 3 parts—spring unit,  
stud and cross pin.

Instant locking and unlocking  
—operates with about 1/4 turn.



**SHAKEPROOF inc.**

*"fastening Headquarters"*

Distributor of Shakeproof Products Manufactured by ILLINOIS TOOL WORKS

2501 North Keeler Avenue, Chicago 39, Illinois

Plants at Chicago and Elgin, Illinois

In Canada: Canada Illinois Tools, Ltd., Toronto, Ontario

*Free Catalog AD-2 gives full information  
on Shakeproof Cowl Fasteners including  
engineering, procurement and assembly  
data. Write for your copy now!*



## Assemblies Welded with AMPCO METAL Assure Rigid, Safe Construction

Coated aluminum bronze welding rods, made from Ampco Metal and known as Ampco-Trode electrodes, were used in the construction of many newly designed 36-foot aircraft rescue boats because the high strength values of the rod assured a rigid weld joint.

These rescue boats, designed to pick up aircraft crews who have crashed at sea, must often buck high waves—strength in each part is imperative. Here the propeller shaft stern tube of manganese bronze is welded to the hull plate of aluminum bronze to form a rigid fabricated unit which resists vibration and shock.

The acceptance by American Industry and Government contractors of Ampco Metal in various forms is based on proven performance by leaders in aircraft, machine tool, ordnance, and heavy machinery fields. Ampco Metal is daily rendering valiant service. With outstanding physical properties, this aluminum bronze alloy has high strength, controlled hardness, and corrosion-resistance—vitally needed for specialized service.

Test Ampco Metal under actual operating conditions and get results that justify your judgment. Ask for "File 41—Engineering Data Sheets," giving case histories and technical information. Sent free on request.



**AMPCO METAL, INC.**

DEPARTMENT 1A-11

MILWAUKEE 4, WISCONSIN

**AMPCO  
METAL**



THE METAL WITHOUT AN EQUAL

of the following Industry Advisory Committee:

### Chain Hoist Manufacturers

Government presiding officer, Franz Stone; committee members are: H. H. Bansau, Conco Eng. Co., Mendota, Ill.; L. R. Cull, Davis Round & Sons, Cleveland; D. S. Brisbin, Columbus McKinnon Chain Corp., Tonawanda, N. Y.; A. M. Harrington, The Harrington Co., Philadelphia; F. W. Coffing, Coffing Hoist Co., Danville, Ill.; S. W. Gibb, Yale & Towne Mfg. Co., Philadelphia, and C. B. Velt, American Chain & Cable Co., York, Pa.

### Cast Iron Hot Water Supply Boiler Industry

David L. Deen, sales manager, Freed Heater & Stoker Co., Collegeville, Pa.; George L. Harberger, sales manager, Eastern Foundry Co., Bovertown, Pa.; Max D. Rose, vice-president, American Radiator & Standard Sanitary Corp., Pittsburgh; F. S. Ross, president, American Boiler & Foundry Co., Milan, Mich.; Frank Werner, president, Werner Foundry Co., Lansdale, Pa.; E. R. Westphal, plant manager, Weil McLain Co., Michigan City, Ind.

••••• OPA recently established the Office Machines Manufacturers Industry Advisory Committee, and appointed the following men to serve on the committee:

Stanley C. Allyn, National Cash Register Co., Dayton, Ohio; W. D. Caton, Standard Register Co., Dayton, Ohio; John S. Coleman, Burroughs Adding Co., Detroit; A. B. Dick, Jr., A. B. Dick Co., Chicago; H. P. Elliott, Elliott Addressing Machine Co., Cambridge, Mass.; Carl M. Friden, Friden Calculating Machine Co., Inc., San Leandro, Cal.; C. S. McAllister, American Perforator Co., Chicago; Joseph E. Rogers, Addressograph Multigraph Corp., Cleveland; Merrill B. Sands, Dictaphone Corp., New York; A. W. Van-

**AWARD:** Gen. U. S. Grant, 3rd, Chief of Protection Branch, U. S. office of Civilian Defense, presents the National Security Award to R. A. Lewis, general manager, Bethlehem Steel Co.



# If You Want to Be Shown...



**I**f you want to be *shown*, definitely and conclusively, that SMITHway Certified Welding Electrodes can give lower welding cost and *better welding results* in YOUR plant before any further discussion, then you speak our language and we speak yours.

That's exactly the way we would feel about it if we were on your side of the desk and you

were on ours. We would want to be *shown*!

The reason we feel so completely confident that SMITHway Certified Welding Electrodes can prove their case in your own plants is that *we use millions of pounds of them every year*. Welding is the *vital factor in everything we do*... and welding electrode *quality and uniformity* are vital factors to the success of *any* welding operation.

## Mild Steel . . . High Tensile . . . and Stainless Steel WELDING ELECTRODES *made by welders . . . for welders*

**SMITHway AC Welding Machine:** no arc blow; reduces spatter losses; effects worthwhile overall power saving; gives more good welds per man-hour.

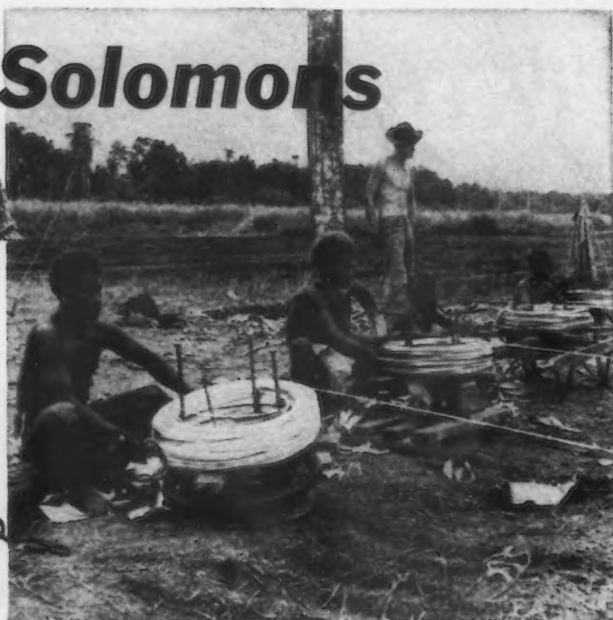
**SMITHway Welding Monitor:** cuts time and cost of training welders as much as 33 1/3%; automatically signals operator when the correct speed of travel and length of arc are being maintained.



# A.O. SMITH Corporation

MILWAUKEE • WISCONSIN • HOUSTON • TEXAS

# In the Solomons



A crew of natives tending the reels as wire is played out for new telephone lines on the Solomons.

Press Association Photo

## and on All Fighting Fronts

# KEYSTONE *Wire*

"Fighting units are no farther apart than the communications that reach them", is a by-word of the Army. And *wire* plays a vital role in linking our fighting units together.

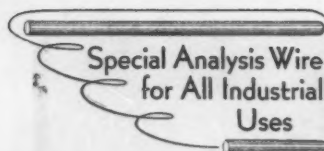
This is one of the many uses of wire mill products at the front. You'll find products made from Keystone wire fulfilling many other essential needs of our fighting forces.

That's why Keystone production for civilian uses must be restricted until victory. But we are looking forward to again supplying *your* civilian needs "when our boys come marching home."



Field communications . . . one of the thousands of war uses for wire mill products.

**KEYSTONE STEEL & WIRE CO., Peoria, Illinois**



SCRAP is still critically needed . . . get every pound to the steel mills.

## NEWS OF INDUSTRY

derhoof, Standard Duplicating Machines Corp., Everett, Mass.; Curtis G. Watkins, Simplex Time Recorder Co., Gardner, Mass.; Thomas J. Watson, International Business Machines Corp., New York.

### OPA Move Seen Hint of Higher Freight Car Castings

Washington

• • • Taken to indicate an early upward re-adjustment of prices for miscellaneous freight car castings, OPA has incorporated an adjustable pricing provision in Schedule 41, providing that producers may deliver or agree to deliver such castings at prices to be adjusted with any OPA action taken after delivery and prior to Nov. 15. Producers, however, may not receive and buyers may not pay any amount which exceeds the maximum prices in effect unless given OPA approval prior to that date.

**ASU ADMINISTRATOR:** Appointment of Col. Edwin W. Rawlings to one of the key positions coordinating the aircraft production program for the Army, Navy and British was announced at Wright Field, Dayton, recently. Formerly Chief of the Resources Control Section of the Materiel Command, he has been named Administrator of the Aircraft Scheduling Unit at Wright Field, succeeding Col. E. M. Powers. He holds a senior pilot's rating and was awarded the Distinguished Flying Cross for heroism while in Hawaii.



# Speeds Material Handling ...for Victory!

## RE-POWER with READY-POWER

### Gas-Electric Power Plant for Electric Truck Operation

R-P power for electric truck operation, handles materials at lowest cost per ton.



Baker Fork Truck



Yale Crane Truck



Hi-Lift Truck

### Continuous Power

INDUSTRY TODAY needs Ready-Power more than ever before to handle materials faster, more economically, and to speed up production to the wartime pitch. Ready-Power equipped trucks handle more loads per hour, per day, per year, than the same equipment battery powered. Ready-Power (Gas-Electric) Units convert ordinary trucks into trucks with higher peak performance because of the continuous flow of power.

### Peak Performance

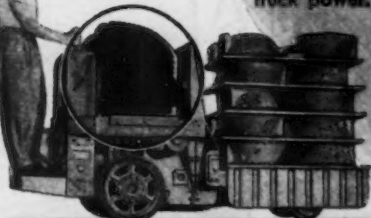
The Ready-Power Company does not make industrial trucks—but supplies the gas-electric power plants that make electric trucks do more work. Truck manufacturers furnish Ready-Power equipment on new trucks at your request—or you can get Ready-Power units to replace batteries now in operation, direct from The Ready-Power Company.



Elwell-Parker Truck  
Steel Handling

Since 1924, thousands of R-P Units have been adapted by industry to their toughest jobs.

R-P replaces storage batteries and charging equipment—makes the electric truck completely mobile—free from limitations imposed by use of batteries for truck power.



R-P power plants are good for the life of the truck—handle the loads quickly.

Automatic Platform Truck

Write for information, mentioning type of new truck contemplated or make and type of trucks now being operated.



Clark Tractor



Mercury Tractor

# THE READY-POWER CO.

3841 Grand River Avenue • Detroit Michigan, U. S. A.



**A Good Place  
to Start  
in Your  
POST WAR  
PLANNING!**

*Install  
or Convert to*  
**STAINLESS  
EQUIPMENT**

**Costs less than you may think if you  
recommend this Borg-Warner Product**

One of the first considerations in planning new construction or rehabilitating present plants and equipment should be to provide protection against corrosion. One of the most economical and satisfactory ways of doing this is to use IngAclad Stainless-Clad Steel... the Borg-Warner Product with a record of more than 10 years of satisfactory service.

**Users of IngAclad include  
these and many others:**  
American Cyanamid Co.  
Armour & Co.  
Corn Products Refining Co.  
Dow Chemical Co.  
Fleischmann Co.  
General Foods Corp.  
Graver Tank & Mfg. Co. Inc.  
Hercules Powder Co.  
Leader Iron Works  
Eli Lilly & Co.  
Monsanto Chemical Co.  
Procter & Gamble Co.  
Sherwin-Williams Co.  
United States Potash Co.

**Sharply Reduces Material  
Cost yet Gives Perfect Protec-  
tion on the side that is used**

As producers of both Ingersoll Solid Stainless Steels and IngAclad Stainless-Clad Steels, our engineers are able to give you unbiased recommendations, based on practical experience in serving America's leaders in the Chemical, Food, Paper, Soap, Textile and other Process Fields.

Prepare now for the competitive days ahead by offering your customers improvement of product, lowering of production and maintenance costs through the use of non-corrosive equipment. It will pay you to investigate IngAclad NOW! Fabricators should write for Free copy of "IngAclad Welding and Fabricating Procedures."

**INGERSOLL STEEL & DISC DIVISION**  
**BORG-WARNER CORPORATION**  
310 South Michigan Avenue • Chicago, Illinois  
Plants: New Castle, Indiana; Chicago, Illinois; Kalamazoo, Michigan

**INGACLAD**  
**STAINLESS-CLAD STEEL**

**"Back the Attack  
with  
WAR BONDS"**

*"A  
Borg-Warner  
Product"*

## **Caution Is Urged In Making Trade Plans**

... Although there will be "almost a tidal wave of ambition in the hearts of many people to modernize and re-establish their countries upon return of peace," it is important for Americans to look at the problems of future foreign trade and investment "without the sugar coating of fine phrases," Joseph C. Rovensky, vice-president of the Chase National Bank, declared Oct. 25 in an address before the convention of the National Foreign Trade Council at the Hotel Pennsylvania.

Pointing out that "we will occupy the key position as a world banker," Mr. Rovensky predicted "a great desire on the part of many countries needing supplies and machinery to buy from us in excess of ability to pay currently." He said "private capital will be cautious about making long-term commitments overseas." As the result, he said, "criticism will arise that private capital is not willing to take advantage of opportunities."

There will be, he continued, "pressures and demands for financial assistance from our government, which means from the pockets of all of us." Then he warned "if private capital is hesitant or unwilling to grant financial assistance in any country it is a very strong indication that public credit should not be granted either."

Mr. Rovensky then urged the need of "machinery for clearing and coordinating the total flow."

**PUTTING THE SPOILS TO USE:**  
Pvt. Kenneth Eash and Corp. James Goodwin, tinker with a Japanese roller left behind when the enemy was routed from its Lae base.





## THIS CUTTING-OFF BLADE *has no comparison*

- NO OTHER BLADE OFFERS THE CONVENIENCE IN OPERATION
- THE EFFICIENCY IN PERFORMANCE • ECONOMY IN USE



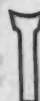
No other cutting-off blade possesses *all* these distinctive features—hollow-ground top, T-shape, and continuous taper its full length. The

hollow-ground top



causes chip to collapse and

relieve excessive friction against sidewalls. It also permits



coolant to

reach actual cutting edge. The T-shape provides constant

back clearance

which never disappears through repeated sharpenings. Empire Tool Company's Luers

Patented Cutting-off Blade is the only machine-ground blade that incorporates

all these



unusual advantages in one cutting-off tool. Here is a blade that

deserves

your serious consideration.

Acquaint Yourself  
with the high efficient  
**FASTCUT**  
Centerdrills and  
Keyseat Cutters

Quick shipments made  
from stock

Blades held in holders made for all these standard hand and  
automatic screw machines listed below:

Acme-Gridley	Davenport	Lathe & Hand Screw	Morey
Bardons & Oliver	Foster	Machines with	National Acme
Brown & Sharpe	Gisholt	round tool posts	New Britain Automatic
Cleveland	Greenlee Automatic	Libby	Simmons
Cone Automatic	Gridley Automatics	Midland	South Bend
		Millholland	Warner & Swasey

**BUY WAR BONDS**

EMPIRE TOOL COMPANY MANUFACTURES LUERS PATENTED CUTTING-OFF BLADES  
AND HOLDERS UNDER LICENSE ISSUED BY JOHN MILTON LUERS PATENTS, INC.

**SEND FOR  
COMPLETE CATALOG**

*Blades, both tapered and parallel on the longitudinal cutting width, carried in stock. Shipped immediately.*

**EMPIRE TOOL COMPANY**  
8788 Grinnell Ave. Detroit 13, Mich.

# EC&M { OIL-IMMERSED CUBICLE-TYPE } STARTERS

FOR  
220-550 VOLT  
SYNCHRONOUS MOTORS

Companion Line to Bulletin 1076-A, Air-Break Starter

LINE AND FIELD  
AMMETERS >

DOOR TO OVERLOAD  
RELAY COMPART-  
MENT AT RIGHT >

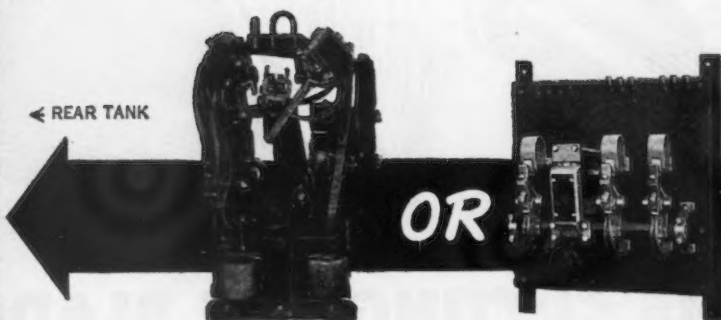
EXCITER FIELD  
RHEOSTAT >

FIELD-PANEL AND  
DISCHARGE RE-  
SISTORS MOUNTED  
IN THIS COM-  
PARTMENT >



STANDARD STARTER

← REAR TANK



At left above, is compensator-mechanism for reduced voltage starting and at right is contactor for full voltage starting. Depending upon the type of starter selected, one or the other of the above is mounted in oil tank at rear.

## COMPLETE UNITS IN *Every* RESPECT



### ELECTRONIC RELAY APPLIES D-C TO FIELD AUTOMATICALLY

View shows automatic field-panel which is mounted in lower compartment of front cubicle and is of tilting-panel type. Easily adjustable, electronic-type relay applies direct current to motor field to pull motor into synchronism automatically.

WITH all internal wiring complete and totally enclosed (NEMA Type I enclosure), these unit-type starters may be mounted out in the plant alongside the motors they control or in a separate control room.

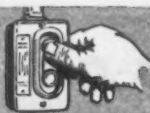
Arranged for two or three phase service. Maximum ratings—(reduced voltage) 150 H.P., 220 volts and 300 H.P., 440 and 550 volts—(full voltage) 400 H.P., 220 volts and 800 H.P., 440 and 550 volts.

Standard features include equipment as illustrated above. Optional features include other NEMA Types of enclosures; voltmeter and other instruments; indicating light; field-removal and automatic resynchronization should motor pull out-of-step, etc.

Complete details given in Bulletin 1075-A. Ask for your copy to-day.

EC&M

COMPLETELY  
AUTOMATIC—



— SYNCHRONOUS  
STARTERS

THE ELECTRIC CONTROLLER & MFG. CO., Cleveland 4, Ohio



They'll do their job



...if we'll do ours!



Garlock

Our fighting men are giving 'em the works—and they'll keep it up until Victory is won. But they're depending on us to do *our* job on the home front. They are depending on us to work a full day *every* day . . . to conserve gas, oil, rubber, metal . . . to buy nothing except necessities and invest the balance of our incomes in War Bonds. They're doing their job—*let's get tough with ourselves* and do our job, too!

THE GARLOCK PACKING COMPANY, PALMYRA, NEW YORK

*Manufacturers of GARLOCK Packings, Gaskets and KLOZURE Oil Seals*

In Canada: The Garlock Packing Company of Canada Limited, Montreal, Que.

**Re-design  
Now!**

**Hundreds of  
Suggestions**

*are offered in this new service...*

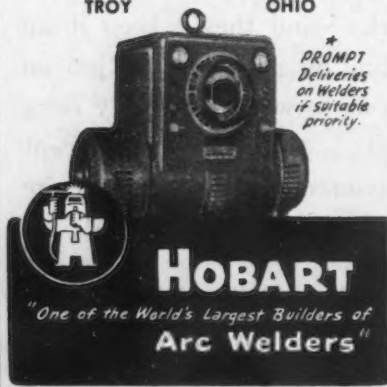
**HOBART**  
"Practical Design for  
Arc Welding"

• This service shows you how you can use steel bars, plates, sheets, angles, channels, beams, pipe, tubing and frame cut sections to cut costs and get better results in designing a new product or re-designing an old one. Hundreds of letters attest to its value. Initial pages without cost. Write for them on your letterhead.

HOBART BROS. CO., BOX 1A-1131

TROY

OHIO



*\*  
PROMPT  
Deliveries  
on Welders  
if suitable  
priority.*

## Briefly Told—

## SWPC Announces New Loan Plan; "Big Inch" Operating After Repair

• Albert M. Carter, acting chairman and executive director of Smaller War Plants Corp., announced a new loan system which will put approved loan funds more conveniently at the disposal of small business concerns engaged in the production of war material or essential civilian requirements. Under this new plan, which will become effective November 1, the Regional Loan Agents of SWPC will enter into repurchase agreements up to 100 per cent with banks on loans of \$25,000 or less where banks agree to close and service the loans. The interest rate shall be 4 per cent on that part of the loan which is carried at the risk of the SWPC with the banks paying 1 per cent per annum as repurchase charge to SWPC.

• The Phoenixville, Pa.-Linden, N. J., delivery branch of the "Big Inch" crude oil pipe line is back in operation after being shut down 52 days for testing and repairs of defective pipe and is now capable of delivering more than 150,000 barrels a day to refineries in the New York area, according to acting Petroleum Administrator for War Ralph L. Davies.

• A plan to exchange war plant workers between the United States and Britain will be inaugurated this month with the departure of four U. S. war workers for a month's visit to British factories and U. S. Army installations in the British Isles, Elmer Davis, director of OWI, announced recently. The OWI and the British Ministry of Information are jointly sponsoring the project.

• The total volume of construction activity in the United States in August was \$601,381,000, the WPB announced recently. This was a 10 per cent decline

from the July level and a 59 per cent drop from the peak monthly activity of the war construction program—nearly \$1.5 billions in August, 1942.

• Production of transport airplanes on the "largest scale" has been launched by Curtiss-Wright Corp. and Higgins Aircraft, Inc., in cooperation with the U. S. Army Air Forces. The plane selected for the project is the giant Curtiss (C-46) Commando, largest twin-engine cargo aircraft type in the world and recognized by aeronautical engineers as one of the most efficient airliners ever designed.

• A new plastic reinforced with glass fibers has been produced with tensile strengths of over 80,000 lb. per sq. in. While the impact strength of ordinary plastics is about 2 ft. lb. on a standard test, samples of the glass and plastic combination have shown impact resistance of over 20 ft. lb. The plastic is employed in aircraft construction, and was described by the director of research of Owens-Corning Fiberglass Corp. at the annual dinner of the Industrial Minerals Division of the A.I.M.E.

• New and improved finishes ranging from white paint, with pigment having one-third more hiding power, to rust-inhibitive priming coats over metal were forecast by Dr. D. B. Dawson, research supervisor of the du Pont Co. pigments department, before the technical symposium of the paint and varnish production clubs.

• A sound motion picture, entitled "If It Happened Here," which depicts the make-

**MORE INVASION CRAFT:** Built in Britain, these craft are the carriers for an assault army. They carry all mechanized units of modern warfare, stores and supplies. This type of craft was used in the landings on Sicily.



For a Durable Paint Finish...

# DEOXIDIZE with Deoxidine

## The Original Phosphoric Acid Metal Cleaner

*Mechanized dip treatment of helmets in preparation for paint finish*

### ACP Inhibitors and Metal Working Chemicals Speed Production of

**GUNS**  
Mounts and Parts

**AIRCRAFT and  
AUTOMOTIVE**  
Body Surfaces  
Engines  
Exhausts  
Other Parts

**MARINE**  
Structures and Parts

**STEEL SHELLS  
and PROJECTILES**  
All Sizes

**BOMBS**  
All Sizes and Types  
and Many Other  
Ordnance Parts

Deoxidine, a phosphoric acid type metal cleaner, removes rust and rust producers, light oil, oxides and annealing scale, from pits as well as from the surface of metal, *creating a chemically clean, slightly etched surface*—the ideal anchorage for enduring paint or lacquer finish. Deoxidine meets Army and Navy specifications for cleaning metal prior to painting.

There are various grades of Deoxidine adapted to the several methods of application and to cleaning surfaces with varying amounts of rust and oil.

The Deoxidine Cleaning process has been standard for more than a quarter of a century and is adapted to the cleaning of steel, aluminum, aluminum alloys, in fact all metals (except zinc and cadmium).

If you have specific cleaning problems and will send us detailed information, our Technical Department will gladly send you prompt advice and recommendations. Please fill in attached coupon.

**AMERICAN CHEMICAL PAINT CO.**  
AMBLER **ACP** PENNA.

*Note: West Coast Plants may address inquiries and orders for prompt delivery to: Leon Finch, Ltd., 728 East 59th St., Los Angeles, Calif.*

American Chemical Paint Company, Ambler, Pa.

Please send me general Technical Service Data Sheets on

☐ Deoxidine

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

E-11

**"What's the Score on  
this Pile-Up  
in Dept. 20?"**



The score is a goose-egg with the rim off. Somebody miscounted in Departments 18 and 19 . . . because there was no means of maintaining an accurate count . . . and so Department 20 wound up the day with a shortage of parts that clogged up final assembly, disrupted today's shipping schedule, and *tomorrow's* production schedule. Nice going, with a war to win —*toward which every minute of the day should be made to count to the utmost.*

And every minute of the working day *can* be made to count to the utmost, if every production machine in

the plant is equipped with a Veeder-Root Counting Device that shows, *as of the present moment*, whether the machine is operating up to scheduled capacity, or whether it is in need of adjustment, repair, or regulation of power-flow. So shortages can be prevented, and interdepartmental co-ordination can be held constantly right on the button. See what Veeder-Root Control-by-Count can do to smooth out and speed up *your* war-production schedules. Write:

VEEDER-ROOT INCORPORATED  
HARTFORD 2, CONN.



**You Always Know the Score on Production  
... when it's kept by **VEEDER-ROOT**  
Counting Devices**

*"Let's pour the work on, chum—  
can't let her beat us everyday!"*



... but it's hard to beat any worker  
who drives **AMERICAN PHILLIPS SCREWS**

It's a fact . . . men have no easy time keeping their production ahead of women workers who have come in . . . *green* . . . and been broken into screw-driving assembly work with American Phillips Screws. For with American Phillips Screws there is no longer the forbidding differential in strength and skill between men and women . . . this modern method of screw driving is a common denominator that lifts the ability of the "weaker sex" to the productive level of the "stronger sex". And here's why:

All there is to do with American Phillips Screws is: (1) insert the Phillips driver in the Phillips Recessed Screw head. (2) Aim the driver with one hand and hold the work with the other. (3) Screw is automatically driven up straight and flush . . . without any effort to keep it straight. There's no premium on skill and strength, as with slotted screws.

And the result: Production is increased as much as *twice* where American Phillips Screws are used. And there are no scarred hands, no scarred work, no broken screw heads . . . because the Phillips driver *can't slip out*.

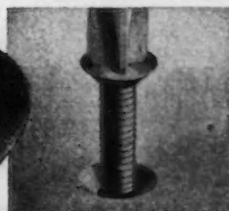
In addition, there are other advantages to the use of American Phillips Screws which come from the name American: Full Value, guaranteed by self-checking count and individual inspection. American Engineering, that gives you expert help on special fastening problems. And American Service, that gives reasonably prompt delivery even in war time.

**AMERICAN SCREW COMPANY**  
PROVIDENCE, RHODE ISLAND

Chicago: 589 E. Illinois Street

Detroit: 5-267 General Motors Building

4-WINGED DRIVER CAN'T SLIP OUT OF  
PHILLIPS TAPERED RECESS



1. Fast Starting—Driver point automatically centers in the recess . . . fits snugly. Screw and driver "become one unit." Fumbling, wobbly starts are eliminated.



2. Faster Driving—Spiral and power driving are made practical. Driver won't slip out of recess to injure workers or spoil material. (Average time saving is 50%.)



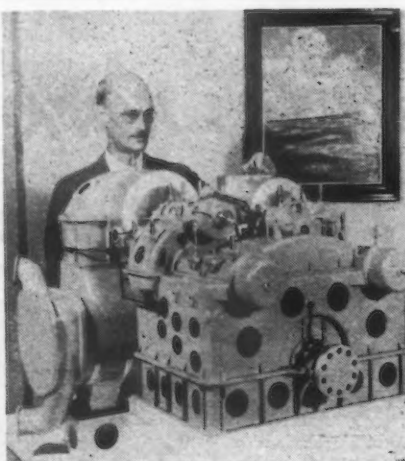
3. Better Fastenings—Screws are set up uniformly tight, without burring or breaking heads. A stronger, neater job results and there are no gouges on work-surface.

up and operation of a typical industrial plant protection organization has been completed by Bethlehem Steel Co. It is available without charge to industrial concerns for showing to their personnel engaged in similar protection work.

• Approximately 50,000 pieces of heavy equipment, roughly valued at \$100,000,000, having served its purpose in the new virtually completed Army construction program, are being redistributed by the Corps of Engineers for use in troop training and other duties both in this country and overseas, the War Department announced recently.

• Following more than a year's research and development work, the Goodyear Tire & Rubber Co. announced recently the conversion of a major portion of its line of industrial rubber goods to synthetic rubber. Products to which synthetic rubber has been adapted include transmission, conveyor and elevator belts, hose V-belts, rolls of all kinds, molded products and similar materials.

• Work lost by stoppages, walkouts, and a strike recently, cost half a destroyer at U. S. Steel's Federal shipyard in Kearny, N. J., it was estimated by Walter C. Hemingway, vice-president and general manager. Delayed deliveries of troopships and combat cargo vessels, in addition to destroyers, will result, he said.



**MARINE EXPERT:** Alexander Kennedy, Jr., assistant to the manager of the Federal & Marine Division, General Electric, inspects a scale model of a geared turbine propulsion set which the company builds for C-2 type ships.

• C. D. Howe, Minister of Munitions and Supply, announced that for the period July 14, 1939, to the end of September this year the total value of contracts awarded on war account and commitments made on Canadian, United King-

dom and other accounts, exceeded \$10,000,000,000.

• News was made at Battle Creek, Mich., recently, when the employees of the Clark Tractor Co. assembled to hold a public dedication service to pledge themselves for still greater effort in their war work which already ranks high.

• Something new! B. F. Goodrich is making a new type of protective skin cream for workers.

• D. W. Prichard, a Quaker Process engineer, was the guest speaker at the September meeting of the Lancaster County Section of the American Electroplaters Society. The meeting took place at the Stevens Trade School, Lancaster, Pa., and H. L. Horis, Hamilton Watch Co., president.

• Would a self-pronouncing (?) glossary of chemical and scientific terms prepared by the Hycar Chemical Co. of Akron, Ohio, interest you? It includes most of the terms which are today tossed around so nonchalantly.

• Col. Gilbert I. Ross, district chief of the New York Ordnance District, recently announced the creation of a technical advisory committee composed of the following members: Gregory Jamieson Comstock, professor of powder metallurgy at Stevens Institute of Technology; Dr. Ralph L. Evans, Ralph L. Evans Associates, New York; Howard A. Poillon, president, Research Corp., New York; Dr. Augustus B. Kinzel, Union Carbide & Carbon Co., New York, and Thomas H. Wickenden, manager of development and research division, International Nickel Co., New York.

• Despite a shortage of manpower, the National Smelting Co., Cleveland, produced 10,000,000 lb. of aluminum and magnesium alloys in September, a new company peak. Seventy per cent of the firm's 1400 employees are Negroes.

• The Galvanizers Committee, which is sponsored by the American Zinc Institute, will hold a wartime conference at the William Penn Hotel in Pittsburgh, Pa., on Wednesday and Thursday, Nov. 17 and 18. In making this announcement, it was stated that, the usual spring meeting having been omitted, many important subjects must now be discussed.

• The Dow Chemical Co. has recently prepared and released a technical film describing processing methods for magnesium alloys. The film deals with machining, welding, forming, riveting, and surface treating. Requests for the film or for information regarding it should be directed to the company at Midland, Mich.

• New York has lost more heavily in relative economic position than any other state as a result of the workings of the war economy, according to the division of industrial economics of the National Industrial Conference Board. Figures compiled by the Board show that prime contracts placed in this state from June,

**Class 3 Fit-**

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**CLEVELAND CAP SCREWS**


THE CLEVELAND CAP SCREW CO.  
2917 E. 79th Street • Cleveland 4, Ohio

**Cleveland Cap Screws**

Set Screws and Special Upset Parts

Made by the Originators of the Kaufman Process for Greater Strength and Accuracy  
Specialists for 26 years in Headed and Threaded Products

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## *Sciaky Announces the Opening of Two New Engineering and Service Offices*

It has always been Sciaky Bros. goal to offer the best of engineering advice on resistance welding problems and to supply the maximum of service to our customers. Strategically located in the two greatest war producing areas, these two new offices will serve to speed up information or service on Sciaky resistance welding.

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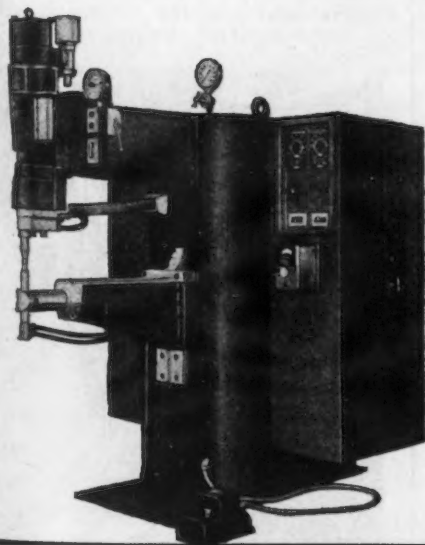
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Write today for Bulletin No. 101-B describing the latest Sciaky press type spotwelder for aluminum and light alloys. Please use company letterhead.



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as shown, 3/16"  
mild steel. Pieces  
must be die cut,  
accurate to size,  
shape, and dupli-  
cation throughout  
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**I**f it is costing you more than it is worth to produce such runs in small lots, which are so important but so troublesome — your jobs can be handled by our methods and process at a comparatively low cost. It will pay you to investigate the amazing facts of the economy blanking and piercing of such large parts by our system. We now have blanking pressure on such large blanks up to a maximum press tonnage of 500 tons.

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and complete booklet.**

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**NEWS OF INDUSTRY**

1940, to June, 1943, amounted to slightly less than 10 per cent of all state awards as compared with a contribution of 13.5 per cent to all value added by manufacture in 1939. New York has received less than 7 per cent of all government-financed war plant.

• Belief among some war contractors that World War I termination claims were settled on the basis of about 14 per cent of the amount due on them was declared "not true," by Col. Bryan Houston, assistant director of the purchases division, Army Service Forces. The fact is that the average settlement on contracts at that period were 14 per cent of the face amount of the contracts. Failure to distinguish between the face value of the contract and the amount due as a result of termination has led to this misunderstanding.

• The greatest treasure hunt the world has ever witnessed is being quietly and scientifically prosecuted in 40 states of the Union, Alaska, Canada, and many of the countries of Central and South America, William Embry Wrather, Director of the Geological Survey, reported recently. The present search is for minerals that make our victory sure—bauxite, alunite, mica, beryllium, mercury, copper, tungsten, iron, molybdenum and a dozen other metals that go into the tools of war.

• The preservation of a low rate of absenteeism by the Lycoming Div. of the Aviation Corp., located in Williamsport, Pa., was revealed recently by P. E. Garland, division manager. The average for the last six months has been less than 2.5 per cent, he said, the percentages in

**MASS PRODUCTION** of synthetic rubber belting is inspected by H. M. Kuhne (left), engineer in charge of development of the belting division of United States Rubber Co.



# Multilith gets it from factory to fighter... FASTER



Remember moving day with all the worry and confusion of moving a single van load of household goods 'round the corner? Imagine what a colossal moving job Uncle Sam faces every day—thousands upon thousands of articles—all varieties, shapes and sizes—to be gathered into vast depots and then sped to fighting men scattered all over the world.

Think of the coordinating, timing, and record-keeping involved. One detail alone—the shipping documents that must accompany each shipment, customarily required writing up and running copies of ten different forms.

Working with U.S. Quartermaster Corps and Army Service Forces, Multigraph\* men developed a method of using pre-printed master sheets called Systemats\*. The Systemat carries "con-

stant" data so that only variable transportation information need be written in by hand or typewriter. Then the Systemats are put on a Multilith\* machine to automatically reproduce the many accurate and permanent copies that are needed.

*By this method a single document replaced the 10 forms formerly used. Time is saved, manpower released, errors eliminated, identification of items made easy, and supplies get to our fighting men more quickly.*

Multilith Systemats are being used in innumerable new ways to streamline paper work of war. Systemat is a word new to American business and industry. Remember it! Systemats can save time, money, and manpower in every department from factory tool room right up to president's office. Let us show you. Write Addressograph-Multigraph Corporation, Cleveland—and in principal cities of the world.

\*T. M. Reg. U. S. Pat. Off.

## Multigraph

TRADE-MARK REG. U.S. PAT. OFF.

**SIMPLIFIED BUSINESS METHODS**

Your newest trainee can't forget  
these "safety goggles"—they're built-in

Extra convenience,  
efficiency, safety,  
... with this

## Delta Tool Grinder

Delta's patented Twin-Lite safety shields minimize the risk to the most inexperienced operator. They increase efficiency and accuracy by flooding the work with light . . . on both sides and face of the wheel . . . at all times, regardless of general lighting conditions in the shop.

This is just one of many features which give you the finest working combination on the market — regardless of price. Simple, easily adjusted attachments for drill grinding, etc. . . . See your Delta industrial distributor — then install one of these efficient machines, for creditable results. Send for Delta catalog.

M-5B

### Specifications

**Safety shields:** Double thickness shatter-proof glass. Two lamps wired to motor switch. Wheel guards meet strict safety regulations of Wisconsin Industrial Commission.

**Tool rests** fully machined, accurate. Fully adjustable, easily detached.

**Wheels:** Absolutely true and vibrationless for accurate, satisfactory results. Balanced to 1/100-inch ounce.

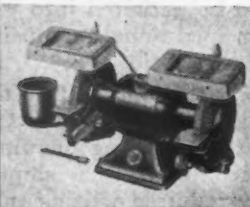
**Size:** One-inch face by 7-inch diameter, 5/8-inch hole.

**Type:** 60N and 46M aluminous oxide.

**Bearings:** Precision double-sealed New Departure ball bearings — lubricated for life, protected against damage from abrasive dust.

**Heavy Base:** 14 1/2" x 15 1/2". Tool rests 39" from floor.

**Price complete f.o.b. Milwaukee,** (depending on type of motor required). \$72.00 to \$89.50. A-I-A priority required.



**Bench Model**

Price complete (depending on type of motor required) f.o.b. Milwaukee, \$56 to \$65.75.

Tear out and mail today

**DELTA  
MILWAUKEE  
Machine Tools**

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Please send me your new catalog giving full details on the Delta Tool Grinder and your full line of low-cost machine tools.

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### NEWS OF INDUSTRY

recent months having been: September 2.6; August, 2.6; July, 2.2; June, 2.8 and May, 2.13. According to Mr. Gallent, the record is due to the loyalty of the majority of the workers and to supervision by the personnel department.

● Generally comparable in all respects with pre-war high quality conveyor belts, development of a new super-quality synthetic rubber conveyor belt was announced recently by Goodyear Tire & Rubber Co. In addition to comparing favorably in flex life, ageing resistance to abrasion and cutting, the new belt has the additional advantages of resisting oil and high temperatures.

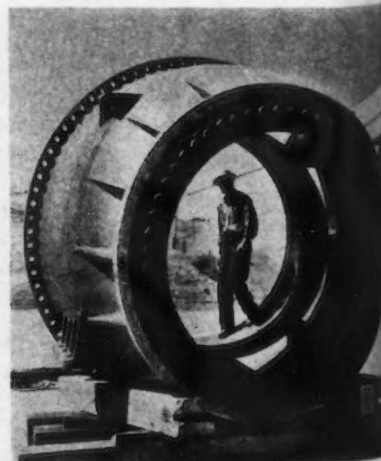
● Designed to maintain a low rate of absenteeism, a unique employees service bureau has been established by the American Can Co. in its Amertorp plant to assist workers with personal problems and do many routine chores for them. Among the services which the bureau provides are: handling gasoline and special mileage applications; purchase of new automobiles, bicycles, tires, tubes and similar items; listing and investigation of rooms, purchase of war bond licenses, etc.

● A new motion picture has been released by the Bureau of Mines titled "Stainless Steel". It was produced in cooperation with the Allegheny Ludlum Steel Corp. Applications for free short-term loans of the film should be addressed to the Graphic Services Section, Bureau of Mines, 4800 Forbes Street, Pittsburgh 13, Pa. The film is 16 mm.

● General Electric Co.'s net sales, billed for the first nine months of 1943 amounted to \$980,226,836 compared with \$654,882,607 for the same period of 1942, an increase of 50 per cent.

● Bison Shipbuilding Co., North Tonawanda, N. Y., launched its 100th steel invasion barge.

**WATER CONTROL:** This huge casting was one of three needle valve cases shipped from Boulder Dam for temporary installation on river and canal outlets through Friant Dam.



September  
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# Melting Steel for Victory

★ Steel, the basic material of World War II, is being melted faster in Lectromelt top charge furnaces. Their quicker charging results in greater efficiency, their rugged simplicity assures ease of operation—they are designed for the quantity and quality production of carbon and alloy steels.

Lectromelt furnaces of the top charge type are built in sizes ranging from 100 to 250 pounds capacity.

*Write for Complete Information*

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Furnace Corporation  
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MOORE RAPID  
*Lectromelt*  
FURNACES



# Prevent accidents with this ASBESTOS Oil and Grease Absorbent

Every time an American workman is injured as the result of slipping and falling on an oil or grease soaked floor, Hitler and Hirohito have real cause to celebrate. Yet these frequent accidents—so costly in money, time, and manpower—need not happen. You can help prevent them with CAREY ASBESTO-SORB.

A free trial will convince you! Write us today for full information and a sample of ASBESTO-SORB for making your own test. Address Dept. 26.



ASBESTO-SORB is an improved, inexpensive, super-efficient compound that absorbs oil and grease — literally "eats it up." ASBESTO-SORB provides a non-skid, non-slip floor surface that's safe, greatly lessening accident danger. ASBESTO-SORB is used dry; nothing to add. It's harmless to floors, hands, shoes, clothing. Economical—can be used over and over again. Quickly spread by hand . . . easily swept up.



FIRE SAFE . . . another quality highly important to you and the war effort. ASBESTO-SORB is rated "Class I," Non-Combustible" by Underwriters Laboratories, Inc.

## Carey ASBESTO-SORB

is excellent for soaking up acids around pickling vats, storage battery spillage, cleaning solutions, etc.

When spread as a mat, ASBESTO-SORB serves as a cushion underfoot. It doesn't "ball up" and is not tracked around the plant.

PROMPT SHIPMENTS IN 50-LB. BAGS FROM 45 BRANCH WAREHOUSES.

**THE PHILIP CAREY MFG. CO.**  
Dependable Products Since 1873.

LOCKLAND, CINCINNATI, OHIO

In Canada: The Philip Carey Company, Ltd.  
Office and Factory: Lennoxville, P. Q.

October 23. Some of its barges were used in the Sicilian and Salerno campaigns. Officials report production a month ahead of schedule.

• Floyd R. Jackson, a millwright at Fedders Mfg. Co., Buffalo, has been awarded a \$1,000 war bond for an improved safety clutch which has been applied to 32 automatic punch presses used in the production of 50-cal. machine gun bullet links. The clutch has eliminated an average of ten machine failures daily, company says.

• Douglass W. Stockham, vice-president of Stockham Pipe Fittings Co., Birmingham, has been elected president of Associated Industries of Alabama. Mr. Stockham was elected at the association's annual meeting, Oct. 21.

• Featured by the award of one medal for 50 years continuous service in the steel and iron business, more than 149 employees of the Tennessee Coal, Iron & Railroad Co., Birmingham, were honored for long service in the second quarter of 1943 with certificates listing from 25 years to 45 years to their credit.

• More than \$1,900,000 worth of contracts were placed by SWPC, Milwaukee district, in a single week recently.

• The last General Sherman tank rolled off the production line at the Pacific Car & Foundry plant, Renton, Wash., recently. The plant, which converted last year from production of railroad cars to tanks, now will produce fabricated wing parts.

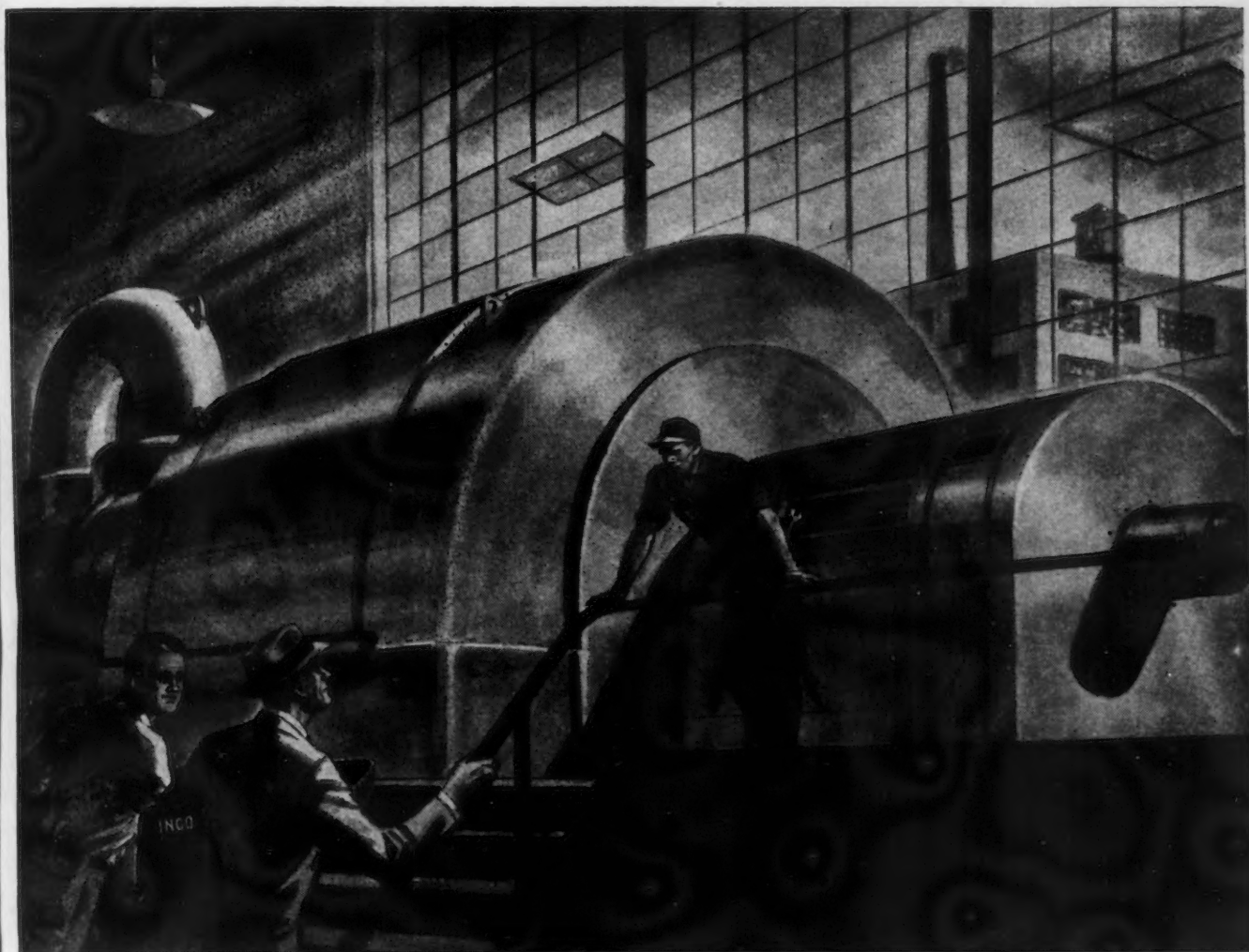
• International Harvester, Milwaukee, through its labor-management committee, has awarded 714 cash prizes for suggestions to improve production. Biggest one recently awarded was \$150 to a jeweler in the gyro department for assembling improvements that saved 3600 man hours.

• A. O. Smith Corp., Milwaukee, showed net income of \$5,633,723 for the year ending July 31, compared with \$3,700,995 for the previous year. Sales were \$173,268,447, a huge increase over previous years.

• The Rust Engineering Co., Pittsburgh, has been awarded contracts of more than \$1,000,000 for construction in the Eastern Coastal Area, by the U. S. Navy. The work comprises construction of two warehouses, a mess hall, an ordnance assembly plant, etc.

• An advertising campaign directed against inflation, and including free factory poster distribution, will be launched shortly by the Koppers Co., Pittsburgh. The poster is illustrated and offered in single pages scheduled for magazines covering management and heavy industry.

• The Westinghouse Electric & Mfg. Co. disclosed recently that it has completed post-war reconversion plans designed to maintain a war-expanded production level and provide jobs for the company's 106,000 employees. Westinghouse will be able to resume manufacture of civilian products "within a few months, at the outside," after the war ends, A. W. Robertson, chairman, announced.



## NICKEL AIDS THE POWER INDUSTRY *to KEEP 'EM OPERATING!*

In this day of acute shortages of almost everything, power plant engineers are doing an amazing job of meeting demands for power—the power to keep 'em operating.

Part of this success is due to their foresight in specifying materials that assure long life and withstand the added hardships imposed by ever-increasing peak-load demands.

With the production of tanks, guns, and planes dependent upon power capacity, Nickel makes a valuable contribution towards uninterrupted operation, through the improved properties it imparts to ferrous and non-ferrous

alloys used in power plant equipment.

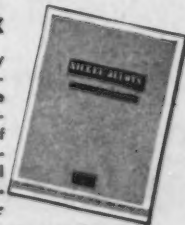
So today the exigencies of war illustrate more clearly than ever the simple truth of the familiar axiom, "A little Nickel goes a long way" toward increasing the dependability of power plant equipment, from turbine blades to high pressure valves, from flange bolts to shaft forgings.

The technical staff of International Nickel has been privileged to cooperate with the power plant engineers and Government authorities who have made possible the great increases in power on which so much of the war effort depends. INCO engineers and metallur-

gists offer counsel and data to all who desire assistance in the selection, fabrication, and heat treatment of ferrous and non-ferrous metals.

### New Catalog Index

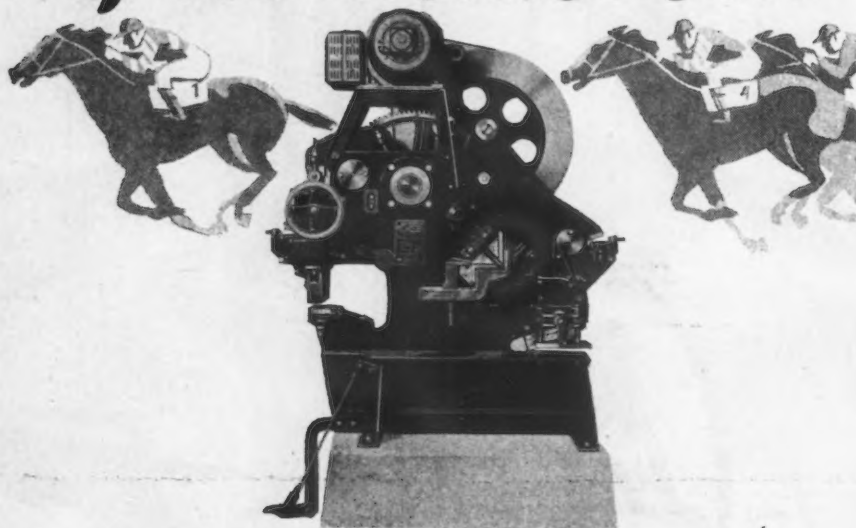
New Catalog C makes it easy for you to get Nickel literature. It gives you capsule synopses of booklets and bulletins on a wide variety of subjects—from industrial applications to metallurgical data and working instructions. Why not send for your copy of Catalog C today?



★ *Nickel* ★

**THE INTERNATIONAL NICKEL COMPANY, INC., 67 Wall St., New York 5, N. Y.**

# Pacemaker...



*...on the  
production straight-away*

Metal fabricating steps to the fore — and stays there — with Buffalo Universal Iron Workers in the production race. Built to handle a wide variety of fabricating operations, with but slight adjustments for different kinds of stock, these Buffalo machines are easy to control, accurate, dependable under

the severest demands for continuous, 24-hour-a-day service. Included in their applications are punching, shearing, slitting, coping and notching of stock such as angles, tees, channels, rounds, squares, flats and plates. Bulletin 322-K will bring you full engineering data. Send for your free copy.



## BUFFALO FORGE COMPANY

492 BROADWAY

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Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

**FAST  
VERSATILE...**

*Buffalo*

**UNIVERSAL  
IRON WORKER**

## NEWS OF INDUSTRY

### First Installment Of Seized Patents

*Continued from Page 96*

drel bar of tube push benches in which the carriers of pivoted mandrel bar supports are removably inserted between the drawing rings in the bed of the push bench. Heinrich Heetkamp, Germany. 8-30-32.

#### Class 185—Motors

- (27) 1,757,270. Device for generating and utilizing centrifugal forces. Otto Stinner, Germany. 5-6-30.
- (37) 1,673,197. Arrangement of series-connected wire springs in spring motors, in which the provision of spring drums is omitted. H. Kollmann, Germany. 6-12-28.
- (40) 1,623,995. Apparatus for driving typewriters provided with calculating mechanism. T. Buschmann, Germany. 4-12-27.
- (40) 1,624,301. Electrically operated automatic winding device. Masaji Yokoyama, Japan. 4-12-27.
- (40) 1,833,071. Striking clock with electric winding mechanism and running reserve. Carl Doll, Germany. 11-24-31.
- (40) 1,839,356. Electromagnetic winding mechanism for clockwork. Aurel Szenté, Austria. 1-5-42.
- (46) 1,972,971. Retarding device for the blade operating mechanism of photographic shutters. Arpad Barenyi, Germany. 9-11-34.
- (2) 1,751,310. Driving arrangement for talking machines. Mathieu de Wrangell, France. 3-18-38.
- (2) 1,784,159. Double control device for phonographs. Wassily Rebikoff, France. 12-9-30.
- (11) 2,118,790. Electromechanical winding device. Raoul Fouques and Jacques Lenfant, France. 5-24-38.
- (39) 2,205,083. Driving mechanism of the barrel type. Paul Cazes, France. 6-18-40.
- (39) 2,274,430. Turning gear for internal combustion engines. Henry Potez, France. 2-24-42.
- (40) 1,631,801. Electromagnetic device producing a constant moving force. Albert Epitoux, France. 10-20-31.
- (40) 1,828,202. Electrical timing device. Henri Rodanet, France. 10-20-31.
- (41) 1,632,264. Starting device for a combustion engine arranged on a vehicle. August Avis, Dutch East Indies. 6-14-27.
- (41) 1,993,645. Mechanism for the release of movable organs subjected to the action of a high return or counter force such as the movable part of a spring starter for internal combustion engines. Louis Birkigt, France. 3-5-35.
- (41) 2,040,197. Mechanism for the tripping or release of movable organs. Louis Birkigt, France. 5-12-36.

#### Class 7—Compound Tools

- (15) 2,011,620. Pocket implement which carries one or more convenient tools, together with means to cover the tools. Otto Altenbach, Germany. 8-20-35.
- (16) 1,755,946. Knife handle of the kind fitted with tools, such as screw drivers, wedges, etc. Otto Altenbach, Germany. 4-22-30.
- (11) 1,811,982. Knife adapted for multiple uses and comprising a monkey wrench. Jean Soustre, France. 6-30-31.
- (16) 1,757,029. Combination tool comprising a shovel, a pick, an axe, and shears. Guillaume Vivenoy, Belgium. 5-6-30.

#### Class 22—Metal Founding

- (1) 1,671,620. Method of producing type wheels and type cylinders with raised characters on their peripheries. Eduard Marek von Marchthal, Germany. 5-29-28.
- (2) 1,942,243. Plate depositing table for casting machines. H. Fritz, Germany. 1-2-34.
- (10) 1,968,703. Core molding apparatus for the core box arranged for rotation. Walter Peyinghaus, Germany. 7-31-34.
- (10) 2,025,424. Sand core forming apparatus for feeding the air to the sand container. Albert Stahn, Germany. 12-24-35.
- (11) 1,735,890. Core peeling device for foundry.

# Indispensable



COURTESY WESTMOUNT TOOL WORKS, QUEBEC, CANADA

Jones & Lamson Optical Comparators are used to inspect positively and rapidly punches and other products with symmetrical and irregular contours held to close limits, at the Westmount Tool Works, Canada.

## Jones & Lamson Optical Comparators

are indispensable for the accurate, rapid inspection of irregular contours that are held to close limits. By no other means can they be inspected as positively and as rapidly.

Because of wartime restrictions we cannot illustrate many of the remarkable applications of these **Comparators**, how

their use has solved seemingly impossible inspection problems and helped to speed the production of vital products. But — our inspection engineers are available to study your inspection problems and give you the benefit of more than twenty years' experience, pioneering and developing Inspection by Optical Projection.



# JONES & LAMSON

Universal Turret Lathes . Fay Automatic Lathes . Automatic Thread Grinders . Optical Comparators . Automatic Opening Threading Dies

MACHINE CO., SPRINGFIELD, VERMONT, U.S.A.  
*Profit-producing Machine Tools*

# DON'T LET THE CHIPS fall where they may!

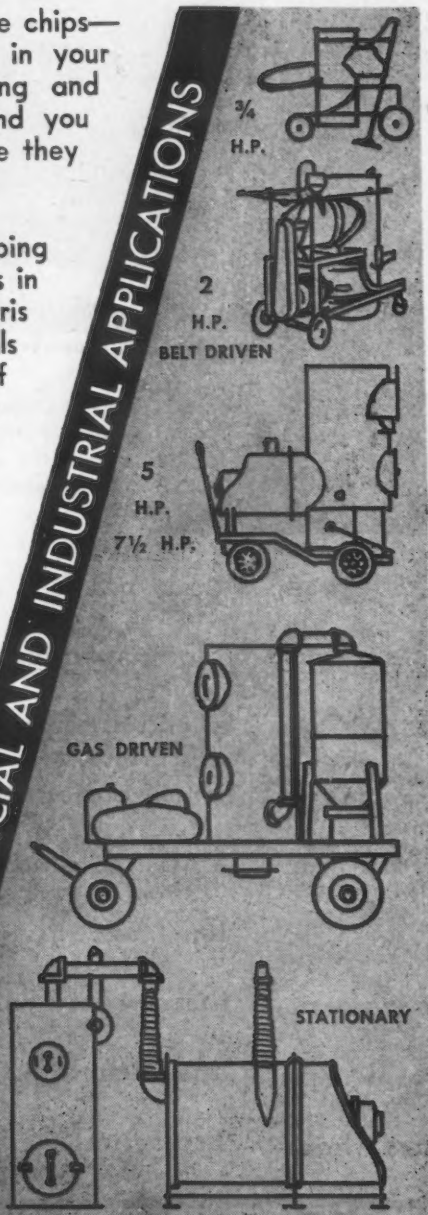
More production means more chips—more dirt—and more dust in your plant—more people working and fewer people to clean. And you can't let the chips fall where they may.

Spencer Vacuum is helping build planes, guns, and tanks in a dozen ways. It keeps debris off the floor, dust off the walls and the work, and dirt out of the machinery. It is ideal for bench cleaning, or for reclaiming valuable materials such as metals, powders or fibres.

It cleans the product—between processes—before painting—before delivery.

The Spencer Portables shown on this page are Standards. Stationary systems also made up to 100 horsepower. Ask for Bulletin No. 125.

FOR ALL COMMERCIAL AND INDUSTRIAL APPLICATIONS



## SPENCER VACUUM

HARTFORD

### CLEANING

THE SPENCER TURBINE COMPANY, HARTFORD 6, CONN.

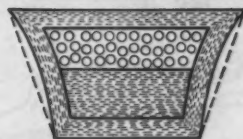
- dries, for the trimming, peeling or shelling of sand cores for casting purposes. Rudolf Brune, Germany. 11-19-29.
- (16) 1,732,382. Mold for aluminothermic welding of rails. Hermann Schultz, Germany. 10-22-29.
- (20) 1,789,643. Method of producing and feeding cores with the drying chambers arranged in such a manner that they are always kept filled with cores. Robert Ardet, Germany. 1-20-31.
- (20) 1,925,890. Apparatus for the mass production of cast articles. Johannes Wilbers, Germany. 9-5-33.
- (25) 1,781,451. Means for making double-cored molds. G. Eckstein, Germany. 11-11-30.
- (28) 1,652,332. A machine in which a number of molds for grate bars of different sizes are made automatically. Theodor Thomsen, Sr., and Theodor Thomsen, Jr., Germany. 12-13-27.
- (32) 1,905,358. Lowering device in molding machines with a lowering arrangement, generally called hydraulic lowering, which operates entirely without shock. Gustav Zimmermann, Germany. 4-25-33.
- (36) 1,697,160. Sand thrower for use in filling molds in foundries. Bruno Berghaus, Germany. 1-1-29.
- (36) 1,865,145. Portable sand distributor for filling molding boxes, molding channels and the like with molding sand. Wilhelm Seidemann, Germany. 6-28-32.
- (36) 1,894,877. Apparatus for filling sand into mold boxes which are used in foundries. Wilhelm Kurze, Germany. 1-17-33.
- (36) 1,923,237. Means of mass production of sand molds and cores of complicated design. Albert Stahn and Bruno Berghaus, Germany. 8-22-33.
- (36) 2,107,814. Method for the production of blown sand-cores and molds, particularly of green sand. Carl Billand, Germany. 2-8-33.
- (51.10) 1,734,316. Casting machine in which castings can be made that require exceptional density to be imparted by the casting operation. Hans Wetzler, Germany. 11-5-29.
- (57) 2,012,189. Automatic casting machine for metal bars as used in composing machines. Hanns Fritz, Germany. 8-20-35.
- (57-20) 2,131,307. Longitudinal shape of a chill adapted for continuous string casting of steel. Gerhard Behrendt, Germany. 9-27-38.
- (57-30) 2,268,100. Apparatus for continuous casting. B. Zunckel, Germany. 12-30-41.
- (58) 1,920,620. Die casting machine for casting the liners of bearing steps. Gottlob Aichele, Germany. 8-1-33.
- (60) 2,264,456. Method of casting metals in which the metal being cast is aluminum, or an aluminum alloyed with such metals as copper and/or magnesium.
- (65) 1,648,442. Casting machine in which the centrifugal force inherent in rotary molds is utilized to determine the form and dimensions of hollow bodies. Heinrich Burchartz, Germany. 11-8-27.
- (65) 1,650,987. The process of centrifugally casting hollow bodies in a centrifugal casting machine with only one relatively displaceable spout. Johann Holthaus, Germany. 11-29-27.
- (65) 1,815,093. Centrifugal tube-casting apparatus comprising a hollow, cylindrical casting and a longitudinally-moving carriage whereon the casing is mounted. Isidoro Bignami, Ercole Galassini, Emilio Franchi, and Giulio Pons, Italy. 7-21-31.
- (65) 1,876,261. Centrifugal apparatus for casting metals and metalloids comprising a rotatable base and molds arranged on said base in upright position. George Pemetrieder, Germany. 9-6-32.
- (65) 1,904,831. Apparatus for casting hollow bodies in chill molds rotatable about vertical axes. Albert Keup, Germany. 4-18-33.
- (65) 1,921,699. Centrifugal casting apparatus for preparing open and closed hollow bodies. Willibald Raym, Karl Mertens, and Albert Salzer, Germany. 8-8-33.
- (65) 1,949,021. Device for casting by centrifugal force comprising a rotatable support and a mold mounted on said support. Joseph Leuser, Germany. 2-27-34.

(To Be Continued in an Early Issue)

# MORE POWER FOR VICTORY THROUGH *Matched-Quality* DODGE D-V DRIVES

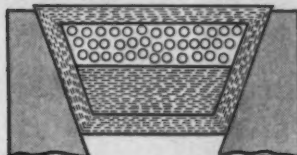


## ON THE STRAIGHT RUN



Dodge D-V Belts have concave sidewalls.

## ON THE D-V MATCHED SHEAVE



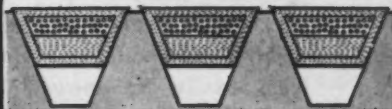
Sidewalls flatten to straight surface when flexing around sheave, thus providing full flat contact between belt sides and sheave-groove.

## CONCAVE SIDEWALL PREVENTS THIS CONDITION



Sidewalls that are flat on the straight run, bulge in center as they flex around sheave, thus making only partial contact with groove, and causing undue wear.

## EQUAL TENSION IN DODGE D-V BELTS



Correct engineering and precision manufacturing of both D-V Sheaves and D-V Belts ("Matched Quality") assure even tension on all belts of D-V Drives.

## RESULT OF UNEQUAL TENSION



If V-Belts and Sheaves are NOT matched, some belts will be too loose, others too tight; unequal tension means power loss and undue wear.

## Matched to Get More Battle Power Out of Horsepower

In thousands of war production power transmission installations, Dodge Matched-Quality D-V Belts and Sheaves are delivering maximum developed horsepower to the point of production, to create more battle power and hasten Victory. Because sound engineering is combined with precision manufacturing, Dodge Matched-Quality D-V Drives have proven efficient, economical and able to stand the punishing 'round-the-clock' performance demanded today.

## You Get These *Advantages* In Dodge D-V Matched Drives

1 - Sheaves (in metal or "Victory" wood) have precision groove diameters, matched with D-V Belts, for uniform belt tension; each belt pulls its share. 2 - D-V Belts have concave sidewalls which, when flexed around sheave, form straight surface for full contact with flat sides of grooves; full transmission of power; longer belt life. 3 - Clean, noiseless drives, requiring no lubrication

of any kind . . . no oil leakage or throwing of lubricant to damage work or rot belting. 4 - D-V Belts, cured under tension, require no adjustment, last longer; won't sag or slip. 5 - Matched sheaves and D-V Belts form complete modern power transmission unit backed by one responsibility: DODGE!

See Your Local Dodge Distributor or Write For Data to

DODGE MANUFACTURING CORPORATION, Mishawaka, Indiana, U. S. A.

**DODGE  
VICTORY  
WOOD**  
*Matched*  
**D-V SHEAVES**



**DODGE CAST IRON  
PRECISION**  
*Matched*  
**D-V SHEAVES**



# DODGE

MISHAWAKA



THROW ALL YOUR SCRAP INTO THE FIGHT! BUY MORE WAR BONDS!  
THE RIGHT DRIVE FOR EVERY JOB

D-V Drive on  
Foundry Sand Blaster.

# PUT ALL YOUR POWER IN THE JOB

# Logan BALL TRANSFERS



**SPEED HANDLING  
OF SHIP PLATES**



**I**N this plate shop of a prominent West Coast shipyard, Logan Ball Transfers are contributing to the speedy and efficient handling of ship plates. Plates can easily be moved in *any direction* over the ball tops, and the pedestals allow workers to move freely around their work throughout the entire area.

Logan Ball Transfers consist of a large steel ball which rotates on a bed of smaller balls contained in a hardened steel cup. They are available in several sizes and are adaptable to table mounting for use at transfer points in roller conveyor lines.

This is one of many types of Logan conveying equipment helping to boost war output. Logan makes both gravity and power conveyors for steel mills, foundries and for the metal working industries in general. Write today for catalog, or get in touch with your nearest Logan engineer. Logan Co., Incorporated, 345 Cabel Street, Louisville 6, Kentucky.

## Logan Conveyors

**PUT FLOW INTO PRODUCTION**

### Among the Week's Trade Notes

Aircraft-Marine Products, Inc., will transfer its plant and offices from Elizabeth, N. J., to Harrisburg, Pa.

Pennsylvania Salt Mfg. Co. will set up industrial research laboratories in Whitemarsh Hall, Springfield Township, near Harrisburg, Pa.

Herkimer Engineer Associates, 11 West 42nd Street, New York, have been organized for the transaction of a general advisory engineering business. Herbert Herkimer is president.

The Link-Belt Co., Chicago, has purchased the manufacturing plant and inventory of the Link-Belt Supply Co., Minneapolis. The entire Minneapolis organization will be retained, present manufacturing facilities will be improved, and stocks expanded as soon as possible.

Expansible Steel Truss Corp., Milwaukee, has changed its name to the Ray J. Mothe Co., Inc., 2708 S. 32 Street, Milwaukee.

Cleveland Co-Operative Stove Co.'s foundry division will henceforth operate as the Cleveland Foundry Co.

Package Machinery Co., Springfield, Mass., has been given permission to erect a three-story addition to Building No. 3, which will provide 1600 sq. ft. additional manufacturing space.

### DPC Contracts

#### Washington

• • • Defense Plant Corp., RFC subsidiary, has authorized the following contracts:

General Cable Corp., New York, to provide additional plant facilities in Missouri at a cost in excess of \$530,000, making a total commitment of more than \$4,850,000.

J. I. Case Co., Racine, Wis., to provide additional equipment at plants in Wisconsin, Illinois, and Iowa at a cost in excess of \$325,000, making a total commitment of more than \$3,350,000.

General Cable Corp., New York, to provide additional equipment at a plant in Rhode Island, at a cost in excess of \$1,200,000, making a total commitment of more than \$1,820,000.

General Cable Corp., New York, to provide additional equipment at a plant in New York at a cost in excess of \$365,000, making a total commitment of more than \$1,200,000.

RMR Corp., Madison, Wis., to provide plant facilities in Wisconsin at a cost in excess of \$785,000.

Otis Elevator Co., New York, to provide additional equipment at a plant in New Jersey at a cost in excess of \$215,000, making a total commitment of more than \$400,000.

Aerojet Engineering Corp., Pasadena, Cal., to provide additional plant facilities in California at a cost in excess of \$80,000, making a total commitment of more than \$330,000.

National Industries, Inc., Fort Wayne, Ind., to provide additional equipment at a plant in Indiana at a cost in excess of \$60,000, making a total commitment of more than \$150,000.

Allen Calculators, Inc., Grand Rapids, Mich., to provide additional equipment at a plant in Michigan at a cost in excess of \$100,000, making a total commitment of more than \$150,000.

Nueces Transportation Co., Corpus Christi, Texas, to provide additional transportation equipment in Texas at a cost in excess of \$100,000, making a total commitment of more than \$250,000.

Garnet Chemical Corp., Allentown, Pa., to provide additional facilities at a plant in Pennsylvania, at a cost in excess of \$25,000.

The War Department announced recently: authorization for construction at an Army Air Forces installation in Dallas County, Texas, to cost in excess of five million dollars. This work is to be supervised by the Denison, Texas, office of the Corps of Engineers.

# Americans know how to take chances



**C**OURAGE to take chances, when there is a real reason for taking chances, has made America what it is today.

And nowhere, short of the battlefield itself, has this trait been more finely manifest than in the deeds and the daring of our American Industries.

In times of national crisis—military or economic—American Industry has been quick to step into the breach, and display the same kind of deliberate, realistic, magnificent courage shown by Washington's men at Valley Forge, by Lee's men at Gettysburg, by Grant's

tired troops in the Wilderness, by Pershing's expendables in the Argonne—and now by our own sons on present battlefronts around the world.

Because American Industry has dared, it has grown strong; and we, as a nation, have come to lean heavily upon it.

HOUDAILLE\* is proud to have played a part in this country's industrial development.

And particularly proud to have contributed something to the miracle of production which every hour, every minute is bringing a United Nations' victory closer and closer.



**HOUDAILLE-HERSHEY CORPORATION**

*General Executive Offices . . . Detroit*

\*Pronounced "HOO-DYE"

# RUTHMAN



## *Gusher Coolant Pumps*

THE OUTSTANDING COOLANT PUMP TODAY



**FLANGE MOUNTED TYPES**

**PIPE CONNECTED TYPES • IMMERSED TYPES**

Cutting tools are made of strategic metals. Avoid wasting these metals and improve your production at the same time by using the proper cutting oils delivered in ample volume by the proper coolant pumps.

The proper coolant pump these days is the Ruthman Gusher Coolant Pump—preferred by so many machine tool builders and users. It was perfected to a high degree long before the war, and it admirably serves the needs of war production—being more free from troubles involving maintenance.

*The*  
**RUTHMAN MACHINERY COMPANY**  
CINCINNATI, OHIO

### **Castings in Aircraft Construction**

(Continued from Page 56)

any parts are found which have defects that would endanger the safety of the airplane, the entire lot is X-ray inspected.

There are some parts, such as the fittings shown in Fig. 21, the failure of which would definitely and immediately endanger the safety of the airplane. These are subjected to 100 per cent X-ray inspection.

All parts receive a further inspection during their processing. The aluminum alloy castings are anodized for corrosion prevention. This shows up any cracks or other flaws that might have been missed by the X-ray inspection. Iron and steel parts are cadmium plated and magnetic inspected as a double check. This reveals defects such as hairline cracks which are extremely difficult to discover by X-ray.

#### **Techniques Constantly Revised**

The use of castings in aircraft structures is still more or less in its infancy. Casting techniques are being refined daily so that assurances can be had that sound castings will always be obtained through improved casting techniques. This is particularly true in the use of steel castings. Heretofore it has been practically impossible to cast high-strength steel alloys in the shapes and sizes required for aircraft parts without the parts having an excessive amount of porosity and shrinkage cracking. There are indications that high-strength steel castings made of 4130 steel or other similar high-strength alloys will soon be available in production quantities and of consistently high quality.

Castings of various types of high-strength bronze are also worthy of consideration in aircraft structures. However, these are not used to any great extent because of the critical nature of the material as far as availability and allocation are concerned. High-strength bronze castings will probably be considered a great deal more than they are at the present time as soon as the critical shortage condition is overcome.

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Now the Hun has real cause to call BRASS:

## "DEVIL METAL"

IT WAS a German scientist who christened brass: "Teufel Metall." And now his choice of names has come home to roost, with brazen claws, on the Wehrmacht. For Yankee brass is spitting an endless stream of shells and bullets from British, French, Russian, and U. S. guns . . . making it even hotter than the devil for Axis forces ashore, afloat, and aloft.

The first U. S. troops to fight in Africa sent back an unofficial citation to munitions industries here at home. They had expected a certain amount of trouble . . . duds, rim-firing, outsize shells that would jam their guns. *But they had no such trouble at all.* Banged around, buried in sand, moored in cases to buoys for days . . . it didn't mean a thing to Yankee ammunition. Each hammer-fall paid off with a G. I. shot . . . on the nose . . . right now!

All of which bespeaks conscientious teamwork on the home front. In this team, Bristol is doing everything conceivable to keep its part of the faith. Every inch of Bristol Brass sheet, rod, and wire goes to the munitions makers as completely 1-A as we can make it . . . rolled and drawn to uniform tolerances exceptional even for Bristol. For it is vital to us to *know* . . . as far as our own product is concerned . . . that every single time a gunner pulls his trigger on a shell of Bristol Brass, he has the best chance we can give him to score a direct hit.

## BRISTOL BRASS

The Bristol Brass Corporation, Bristol, Conn.

\$\$\$ BUY WAR BONDS TO BUY BRASS FOR BULLETS ||||

# PERSONALS

• **Joseph B. Terbell** was appointed first vice-president of the American Manganese Steel Div. of the American Brake Shoe Co. recently. Mr. Terbell has been with the company for 15 years, serving in various sales capacities. In 1940 he was appointed a vice-president of the American Manganese Steel Div.

• **Clyde Llewellyn** has been elected vice-president in charge of operations of Bliss & Laughlin, Inc., Buffalo. Mr. Llewellyn has been with the company 15 years. For the past two years he has served as assistant to the president. **J. Stanley McCord**, district manager of the Philadelphia office for the company, has been appointed sales manager of the Eastern division with headquarters at Buffalo. **John O. Hoover** will succeed Mr. McCord as district manager of the Philadelphia office.

• **Wilbur H. Whitty** has been appointed manager of the Baldwin Locomotive Works new district office at 10 High St., Boston. He will direct sales in the New England area for all divisions of the company. Mr. Whitty founded the Whitty Mfg. Co., Inc., Boston, in 1929, serving as president until 1942, when he joined the WPB as head industrial specialist for New England.

• **Col. Burton H. Witherspoon** has resigned as executive vice-president of the Buffalo Chamber of Commerce to become executive assistant to the vice-president of the Curtiss-Wright Airplane Division.

• **J. G. Graham**, manager of railway sales for Oliver Iron & Steel Corp., Pittsburgh, has been appointed a member of the Rails and Accessories Industry Advisory Committee of the WPB.

• **A. R. Nettenstrom** has been appointed first vice-president of American Forge Division, American Brake Shoe Co., Chicago. He was formerly vice-president in charge of operations.

• **R. F. Pearson** was recently appointed Eastern district manager of sales for Granite City Steel Co., Granite City, Ill. Mr. Pearson succeeds **Charles R. Wallander, Jr.**, who has joined the Armed Forces. His office will be at 68 Beaver Street, New York.



**JOSEPH B. TERBELL**, first vice-president of the American Manganese Steel Div., American Brake Shoe Co., New York.



**VICTOR P. SHAFFER**, engineer in charge of design, H. K. Porter Co., Inc., Pittsburgh.

• **R. H. McCormick** has been made the advertising manager of American Hoist & Derrick Co., St. Paul. Prior to this appointment he was advertising manager for Vascoloy - Ramet Corp., Chicago.

• **Thomas O'Malley** has recently been appointed division manager for the New England territory, Aro Equipment Corp., Bryan, Ohio. **James Littleton** was made division manager in the southern Ohio district, with headquarters in Dayton, Ohio. Mr. O'Malley was formerly with L. L. Ensworth & Co., Hartford. Mr. Littleton was formerly co-division manager in the Cleveland territory of Aro Equipment Corp.

• **Henry D. Scott** has resigned as vice-president of Wheeling Steel Corp. Mr. Scott will continue to be associated with the management of the corporation of which he is a director. **John H. McElhinney** was elected vice-president in charge of operations, succeeding Mr. Scott. Mr. McElhinney has served as assistant vice-president of the corporation for the past seven years.

• **Luther H. Atkinson** has been appointed vice-president in charge of sales of the Elastic Stop Nut Corp. of America. Mr. Atkinson was formerly vice-president in charge of marketing for the Weyerhaeuser Sales Co. of St. Paul.

• **Victor P. Shaffer** has been named engineer in charge of design for H. K. Porter Co., Inc., Pittsburgh. He will also direct their program of development and research. Mr. Shaffer was formerly engaged in design, development and plant layout for Calco Chemical Div. of American Cyanamid Corp.

• **N. E. Thompson**, former assistant general superintendent of Republic Steel Corp.'s Birmingham division, has been appointed general superintendent of ore mines for Republic's southern

**LUTHER H. ATKINSON**, vice-president in charge of sales, Elastic Stop Nut Corp. of America.





**JOHN M. DEMAREST**, plant manager of the Paterson, N. J., plants of Wright Aeronautical Corp.

• **John M. Demarest**, consulting and plant engineer for the past 25 years and recently associated with the WPB in charge of aircraft plant expansion, has been named plant manager of Wright Aeronautical Corp. plants in the Paterson, N. J. area.

Mr. Demarest, who became associated with the corporation recently as assistant to the general superintendent, was formerly plant engineer of the International Business Machines Corp.

• **John C. Buchanan** has been appointed plant manager of the Muskegon Heights plant of Norge Div. of the Borg-Warner Corp. Formerly assistant plant manager of the Muskegon plant, he succeeds **Harry L. Spencer**, who has resigned.

**James R. Weaver** has been appointed manager of the Naval Ordnance plant at Center Line, Mich., operated by Westinghouse Electric & Mfg. Co. Mr. Weaver had been manager of the Westinghouse-operated Naval Ordnance plant at Louisville.

• **Bert Borchardt**, who has been associated with Arens Controls Inc., Chicago, for the past two years has been appointed manager of the West Coast branch in charge of all contact operations in that territory. **Philip Hooker** has been appointed sales and advertising manager of the company. Mr. Hooker comes to Arens from Bell Aircraft, Buffalo, where he was executive assistant manager of the contracts department.

operations. **W. G. Hippard**, former chief engineer at Republic's coal mines, Uniontown, Pa., has been appointed general superintendent of coal mines for the corporation's southern operations.

• **Harry G. Porch** has retired as manager of sales of the Boston office of Lukens Steel Co. after 48 years' service with the company.

• **Theodore J. Kauffeld** was recently elected a director of Burchell Products, Inc., New York, and appointed vice-president and general manager.

**THEODORE J. KAUFFELD**, vice-president and general manager, Burchell Products, Inc., New York.



**BERT BORCHERDT**, manager of the West Coast Branch, Arens Controls, Inc., Chicago.



## OBITUARY...

• **W. G. Bullock**, patent engineer for the Tennessee Coal, Iron & Railroad Co., Birmingham, died Oct. 10. Mr. Bullock, who recently was presented an award in recognition of 25 years of continuous service, was 55 years old.

• **Ollie T. Parker**, sales engineer for Mississippi Valley Structural Steel Co., Melrose Park, Ill., died Oct. 5.

• **Julius K. Fons**, one of the founders and former vice-president of the Maynard Electric Steel Casting Co., Milwaukee, died Oct. 8. At the time of his death he was superintendent of the Crucible Steel & Casting Co. He was 59 years of age.

• **William S. Tuckwell**, president of the Tuckwell Foundry & Plating Works, Merrimac, Mass., died Oct. 13. He was 76 years of age.

• **Samuel S. Hargraves**, vice-president and manager of the machining division of the Melling Forging Co., died at his home recently.

• **E. C. Biewend**, vice-president and general manager of the Decker Screw Products Co., died of a heart attack at his home at Albion, Mich.

• **Thomas E. Kilby**, president of the Kilby Steel Co., Anniston, Ala., and a former governor of Alabama, died at his home at Anniston, Oct. 22. He was 78 years of age.

• **Patrick M. Cullen**, supervisor of war work in the General Electric Co., Lynn (Mass.) plant, died Oct. 18. Mr. Cullen was associated with the company 33 years.

• **Raymond T. Lamgenbach**, president and treasurer of the Berger Metal Culvert Co. of New England died Oct. 18. He was 69 years of age.

• **Frank R. Collier**, founder of the Collier Corp., Holyoke, Mass., died Oct. 16. He was 73 years old.

• **Charles B. Davis**, retired assistant to the president and former general manager of the International General Electric Co., died Oct. 22.

• **Jay Fletcher Slee**, superintendent of blast furnace and coke plants at the Steel Co. of Canada, Ltd., Hamilton, Ont., died recently. He was 63 years of age.

• **Homer Littlefield**, manager of the mining department, Marion Steam Shovel Co., died at his home in Columbus, Ohio, Oct. 17. He had been with the company for 19 years. He was 66 years of age.

# MACHINE TOOLS

... News and Market Activities

## Warner & Swasey Rehiring Laid-Off Workers

### Cleveland

... Entering the third phase of war production, the Warner & Swasey Co. again has begun hiring skilled workers for the production of various war items after the conversion period that was marked by employee layoffs for the past two months.

While Warner & Swasey machine tool production continued and will continue at a much reduced rate, it was found that conversion could not be made quickly enough to maintain full production personnel. The announcement several weeks ago that the company would take on business for rebuilding Warner & Swasey used equipment served a dual purpose, part of which was the actual business and probably more important was the maintenance of a fuller working staff.

Completed well ahead of schedule, the conversion to war production now will require the addition of about 500 skilled machinists over a period of the next five or six months. Employees released during retooling must

be replaced in the face of a very serious skilled help shortage in the Cleveland area. To accomplish an increase of 500 in the working forces of the plant, with losses to armed services continuing and other losses remaining constant, it is expected that between 1000 and 1500 must be hired. However, when the 500 new employees are obtained, the company will approximately equal its peak employment figure.

Top skilled jobs are going to be difficult to fill. The new products that W & S is working on will require considerably more machine work and less assembly work than machine tools. It is reported that in machine tool production, the ratio is 60 per cent machine work and 40 per cent assembly work, but the new contracts will consist of about 80 per cent machine work. Consequently, many of the old employees of Warner & Swasey who were laid off during the cut-back will be of no use in the new set-up.

Further difficulties presented will include training of workers. It is not

yet known that it will be necessary to set up a school-type training course, but it is certain that some means of training the new employees will be required.

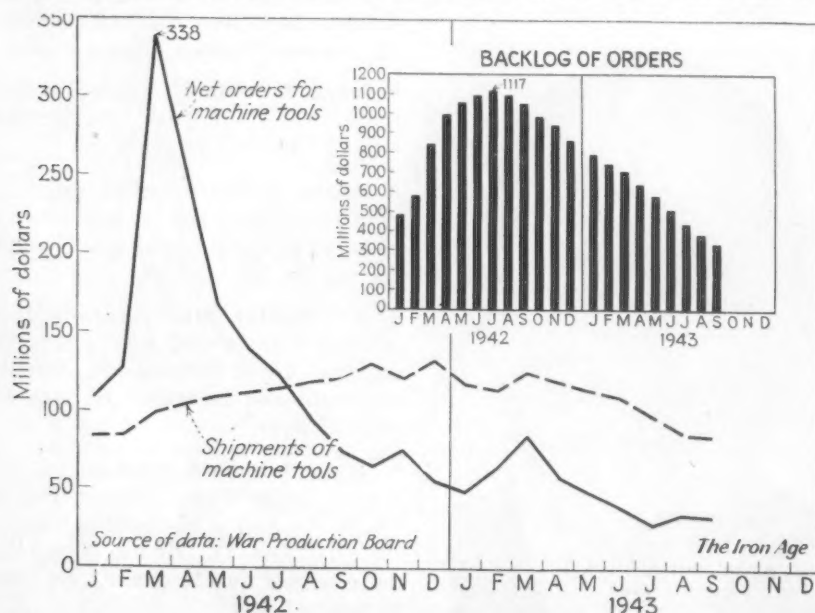
The new products that Warner & Swasey Co. is working on, according to Charles J. Stilwell, president, include parts for airplane, submarine, and diesel engines, as well as parts for power plants for destroyers, torpedoes, jacks for bomb loading, chemical bombs, gun turrets, electric ship hoists, motors for lend-lease, and aircraft superchargers. All of this work is being done on a subcontract basis.

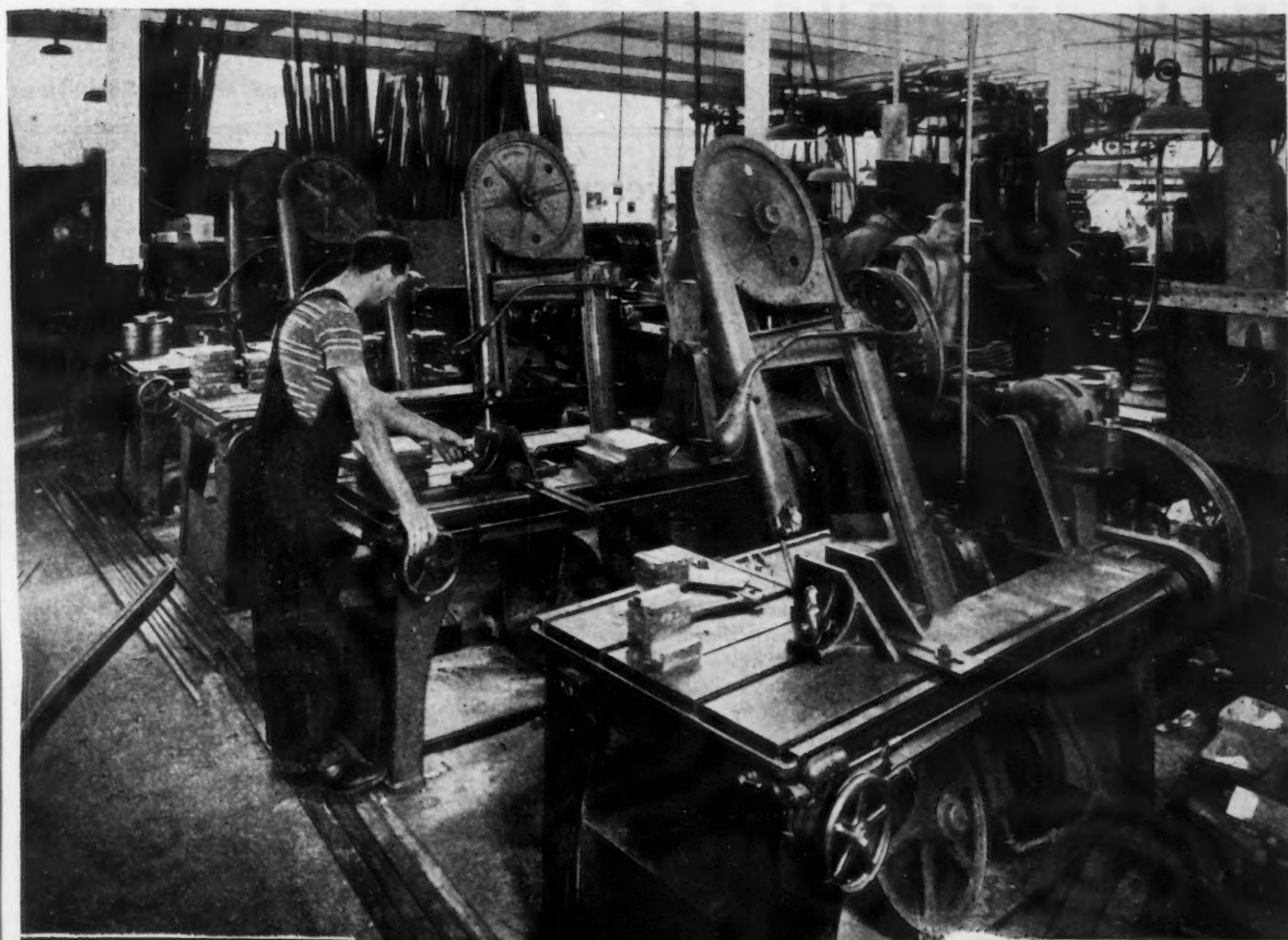
## Termination Chief Topic In Cincinnati Market

... Contract termination and renegotiations are in the forefront of problems of district machine tool manufacturers. Perhaps termination is more prominent at the present time, since there has been a fair quantity of cancellation of orders during this year. The problem of just how much compensation may be forthcoming as the result of the termination of the contract, and just how the pool orders actually function, are most troublesome. As pool orders were set up, it was the general idea that as a manufacturer was able to place a machine within the pool to some private buyer, it would be eliminated from the pool and the government, of course, released from its liability under the contract. In a number of instances, however, purchasers in the mad scramble to get sufficient tools to operate, overbought and subsequently cancelled, and the manufacturers, of course, would return the machines to the pool and in the early periods, the governmental agency accepted the return. In some cases, after the cancellation on the part of the first buyer, machine tool men were able to place the machine with a second purchaser, and in this situation, while there were some acceptances of this as an offset, there has been a tendency to tighten upon this procedure in recent months and questions have been raised as to the propriety in the offset in the termination of the contract. These and other related problems caused some disturbance and unrest among manufacturers.

## September Machine Tool Orders, Shipments Decline

... Machine tool shipments in September totaled \$85,842,000, a decline of 3.2 per cent from the \$87,405,000 August figure, according to the WPB tools division. Unfilled orders at the end of September totaled \$333,119,000, a decrease of about 14 per cent from the total at the end of August. Net addition of orders in September, i.e. new orders less cancellations, were \$31,759,000, about 5 per cent less than in August. At the current rate of shipments, unfilled orders will be cleared in approximately four months.





# MARVEL SAWS

No. 1  
Cap. 4" x 4"

No. 2  
Cap. 8" x 8"

No. 4B  
Light - Duty  
High Speed  
Cap. 6" x 6"

No. 6  
Heavy-Duty  
High Speed  
Cap. 6" x 6"

No. 6A  
Automatic  
Bar Feed  
Cap. 6" x 6"

No. 9  
Heavy-Duty  
High Speed  
Cap. 10" x 10"

No. 9A  
Automatic  
Bar Feed  
Cap. 10" x 10"

No. 8  
Metal  
Band Saw  
Cap. 18" x 18"

No. 18  
Giant  
Hydraulic  
Cap. 18" x 18"

## Accurate, Fast, Dependable and each cutting at a different angle

One of the universal features of MARVEL No. 8 Metal-cutting Band Saws is well illustrated in the above picture taken at the Gorham Tool Company, Detroit. Here a battery of 4 MARVEL No. 8's attended by a single operator, are all busily cutting-off tool bits from nested high speed steel shapes, and each is cutting at a different angle. These MARVEL No. 8's are also used by this firm for cutting-off blanks for side and end mills, and for cutting out crank shaft tools, form tools and dovetails. Handling work to 18" x 18" cross section, almost any type cut, these universal tools have proven "very economical on splitting operations, accurate, fast and dependable."

**ARMSTRONG-BLUM MFG. CO.**

"The Hack Saw People"

5700 Bloomingdale Ave.

Chicago, U. S. A.

Eastern Sales Office: 225 Lafayette St., New York

# NON-FERROUS METALS

... News and Market Activities

## Bauxite Output Creates Controversy

••• From the simultaneous announcements of the War Production Board and the U. S. Bureau of Mines, it is obvious that there is little exchange of information between these two government agencies as to bauxite production. While Harold L. Ickes announced that five private companies have begun commercial development of eight of the newly discovered bauxite deposits, WPB said that there would be a sharp curtailment of bauxite ore production to save labor.

Because of the general improvement in the mining of marginal minerals, production of bauxite by the three major Arkansas producers is being sharply cut by WPB order. However, the Bureau of Mines is planning to continue its exploratory work in the Alabama area until all possible territory there has been covered.

### Marginal Mines Restricted

••• Because of increased mineral production, revised military requirements and a greater need for marginal manpower than for marginal minerals, the WPB on Oct. 27 restricted marginal mineral production.

The chief methods of conserving manpower in mineral production have been: (1) Allocating soldiers who have been released to the Enlisted Reserve Corps (as well as other labor) under a system of mine labor priori-

ties; (2) conserving the use of critical materials and equipment, and production of which requires labor, and (3) so utilizing manpower in the mining industry as to produce the required amount of minerals with the minimum number of men.

To accomplish this, action taken by the Production Executive Committee includes:

(1) The decision that after stockpiles of ferroalloys (vanadium, tungsten, molybdenum, cobalt, etc.) reach recommended levels, domestic production and imports will be kept in balance with the then current consumption. This will insure a supply of ferroalloys adequate to meet the needs of the war and avoid excessive accumulations which would be costly both in dollars and manpower. In this connection, arrangements have been made for reducing the government purchases of certain ferroalloy minerals.

(2) Premium prices in the B range have been denied to lead mines not already operating, and to lead mines having a low labor productivity and located in areas in which there is serious shortage of labor.

(3) Premium prices in the B and C ranges have been denied to zinc mines not already operating, and to zinc mines having a low labor productivity and located in areas in which there is serious shortage of labor.

(4) The government is not now

financing new zinc projects.

(5) It has been determined that no new government purchase contracts should be entered into for the import of chemical chromite, vanadium and cobalt.

(6) Operations in low-grade chrome mines in Montana are to be put in standby condition and labor is to be diverted to mines producing more critically needed minerals.

### Reclaimed Brass Makes New Penny

••• The Bureau of the Mint is planning to resume Jan. 1 coinage of one-cent pieces made of a copper alloy to supersede production of the present zinc-coated steel penny.

Metallurgists of the bureau, with the cooperation of WPB, have perfected methods of combining materials salvaged from expended shell cases and a relatively small proportion of virgin copper so as to permit return to a close approximation of the pre-war bronze cent. Production of the zinc-coated steel piece will be suspended at the year end.

The new alloy will contain slightly less copper and slightly more zinc than the peacetime formula, but the coin will be quite similar in appearance to the traditional coin.

Mrs. Nellie Tayloe Ross, director of the mint, said that experiments recently conducted with the recovered shell cases and added virgin copper proved the alloy satisfactory for coinage. Treasury and WPB officials have been collaborating for several weeks in working out details of the allotment of sufficient copper, including the scrap shells, to permit return to the copper-alloy coin.

Because of the enlarged demand for one-cent pieces, due to accelerated business, a demand which has strained the facilities of the mint, the zinc-steel coins already produced will remain in circulation. However, the natural darkening to which the coins are subject soon will remove the chief source of complaint from the public—the similarity of the piece to the dime.

The mint will use as a base for the new pennies small arms cartridge cases recovered by military authorities from proving grounds, firing ranges and other training areas for troops. These cases consist of 70 per cent copper and 30 per cent zinc,

**BERYL MOUNTAIN:** Experts view large pieces of beryl located by government mining engineers at Acworth, N. H. The crystals are shown dark in color in the photo. The men, left to right, are T. B. Holmes, mining engineer; Paul Balla, U. S. Bureau of Mines, and Philip B. Verplanck, mine operator.



## NON-FERROUS METALS

### REFINER, SMELTER PRICES

(Cents per lb. unless otherwise noted)

Aluminum, 99+%, del'd	15.00
Aluminum, No. 12 Fdy., (No. 2)	13.50
Aluminum, deoxidizing grades	12.50 to 13.75
Antimony, Asiatic, New York	Nominal
Antimony, American, f.o.b. Laredo, Tex.	14.50
Arsenic, prime white, 99%	4.00
Brass, 85-5-5-5 ingots (No. 115)	12.25
Cadmium, del'd	90.00
Cobalt, 97-99% (dollars per lb.)	\$2.11
Copper, electro, Conn. Valley	12.00
Copper, electro, New York	11.75
Copper, lake	12.00
Copper, beryllium, 3.75-4.25% Be; dollars per lb. contained Be	\$15.00
Gold, U. S. Treas., dollars per oz.	\$35.00
Indium, 99.5%, dollars per troy oz.	\$10.00
Iridium, dollars per troy oz.	\$165.00
Lead, St. Louis	6.35
Lead, New York	6.50
Magnesium, 99.9+%, carlots	21.50
Magnesium, 12-in. sticks, carlots	30.00
Mercury, dollars per 76-lb. flask, f.o.b. shipping point or port of entry	\$191 to \$193.00
Nickel, electro	35.00
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per oz.	\$35.00
Silver, open market, New York, cents per oz.	44.75
Tin, Straits, New York	52.00
Zinc, East St. Louis	8.25
Zinc, New York	8.67

### Copper, Copper Base Alloys

(Mill base, cents per lb.)

	Extruded Shapes	Rods	Sheets
Copper	20.87	20.87	
Copper, H.R.	17.37		
Copper, drawn	18.37		
Low brass, 80%	20.40	20.15	
High brass		19.48	
Red brass, 85%	20.61	20.36	
Naval brass	20.37	19.12	24.50
Brass, free cut	15.01		
Commercial bronze, 90%	21.32	21.07	
Commercial bronze, 95%		21.53	21.28
Manganese bronze	24.00		28.00
Phos. bronze, A. B.			
5%	36.50	36.25	
Muntz metal	20.12	18.87	22.75
Everdur, Herculoxy			
Olympic or equal	25.50	26.00	
Nickel silver, 5%	28.75	26.50	
Architect bronze	19.12		

### Aluminum

(Cents per lb., subject to extras on gage, size, temper, finish, factor number, etc.)

**Tubing:** 2 in. O.D. x 0.065 in. wall 2S, 40c. (1/2 H); 52S, 61c. (O); 24S, 67 1/2c. (T).

**Plate:** 0.250 in. and heavier: 2S and 3S, 21.2c.; 52S, 24.2c.; 61S, 22.8c.; 21S, 24.2c.

**Flat Sheet:** 0.188 in. thickness: 2S and 3S, 22.7c. a lb.; 52S, 26.2c.; 61S, 24.7c.; 24S, 26.7c.

2000-lb. base for tubing; 30,000-lb. base for plate, flat stock.

**Extruded Shapes:** "As extruded" temper: 2000-lb. base. 2S and 3S, factor No. 1 to 4, 25.5c.; 14S, factor No. 1 to 4, 35c.; 17S, factor No. 1 to 4, 31c.; 24S, factor No. 1 to 4, 34c.; 53S, factor No. 1 to 4, 28c.; 61S, factor No. 1 to 4, 28 1/2c.

The factor is determined by dividing perimeter of shape by weight per lineal foot.

**Wire, Rod and Bar:** Base price; 17ST and 11ST-3, screw machine stock. Rounds: 1/4 in., 28 1/2c. per lb.; 1/2 in., 26c.; 1 in., 24 1/2c.; 2 in., 23c. Hexagonals: 1/4 in., 34 1/2c. per lb.; 1/2 in., 28 1/2c.; 1 in., 25 1/2c.; 2 in., 25 1/2c. 2S, as fabricated, random or standard lengths. 1/4 in., 24c. per lb.; 1/2 in., 25c.; 1 in., 24c.; 2 in.,

23c. 24ST, rectangles and squares, random or standard lengths. 0.093-0.187 in. thick by 1.001-2.000 in. wide, 33c. per lb.; 0.751-1.500 in. thick by 2.001-4.000 in. wide, 29c.; 1.501-2.000 in. thick by 4.001-6.000 in. wide, 27 1/2c.

### NON-FERROUS SCRAP METAL QUOTATIONS

(OPA basic maximum prices, cents per lb., f.o.b. point of shipment, subject to quality, quantity and special preparation premiums)

#### Copper, Copper Base Alloys

##### OPA Group 1

No. 1 wire, No. 1 heavy copper	9.75
No. 1 tinned copper wire, No. 1 tinned heavy copper	9.75
No. 2 wire, mixed heavy copper	8.75
Copper tuyeres	8.75
Light copper	7.75
Copper borings	9.75
Lead covered copper wire, cable	6.00*
Lead covered telephone, power cable	6.04
Insulated copper	5.10*

##### OPA Group 2

Bell metal	15.50
High grade bronze gears	13.25
High grade bronze solids	11.50*
Low lead bronze borings	11.50*
Babbitt lined brass bushings	13.00
High lead bronze solids	10.00*
High lead bronze borings	10.00*
Red trolley wheels	10.75
Tinny (phosphor bronze) borings	10.50
Tinny (phosphor bronze) solids	10.50
Copper-nickel solids and borings	9.25
Bronze paper mill wire cloth	9.50
Aluminum bronze solids	9.00
Soft red brass (No. 1 composition)	9.00
Soft red brass borings (No. 1)	9.00
Gilding metal turnings	8.50
Unlined standard red car boxes	8.25
Lined standard red car boxes	7.75
Cocks and faucets	7.75
Mixed brass screens	7.75
Red brass breakage	7.50
Old nickel silver solids, borings	6.25
Copper lead solids, borings	6.25
Yellow brass castings	6.25

##### OPA Group 3

Yellow brass soft sheet clippings	8.625
Yellow rod brass turnings	8.375
Zincy bronze borings	8.00
Zincy bronze solids	8.00
Fired rifle shells	8.25
Brass pipe	8.00
Old rolled brass	7.75
Admiralty condenser tubes	8.00
Muntz metal condenser tubes	7.50
Plated brass sheet, pipe reflectors	7.50
Manganese bronze solids	7.25*
Manganese bronze solids	6.25*
Manganese bronze borings	6.50*
Manganese bronze borings	5.50*

##### OPA Group 4

Automobile radiators	7.00
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##### OPA Group 5

Refinery brass	5.00*
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\*Price varies with analysis. 1 Lead content 0.00 to 0.40 per cent. 2 Lead content 0.41 to 1.00 per cent.

### Magnesium

Sheet, rod, tubes, bars, extruded shapes subject to individual quotation. Metal turnings: 100 lb. or more, 46c. a lb.; 25 to 90 lb., 56c.; less than 25 lb., 66c.

#### Aluminum

##### Plant scrap, segregated

2S solids	9.00
All other solids	8.50
Borings and turnings	
Wrt alloys (17S, 18S, 32S, 52S)	7.50
High grade alloys	7.00
Low grade alloys	6.50

##### Plant scrap, mixed

All solids	7.50
Borings and turnings	6.50

##### Obsolete scrap

Pure cable	9.00
Old sheet and utensils	7.50
Old castings and forgings	8.00
Pistons, free of struts	8.00
Pistons, with struts	6.00
Old alloy sheet	7.00

For old castings and forgings, pistons, sheets, add 1/2c. lb. for lots 1000 to 19,999 lb.; for other scrap add 1c.; for lots over 19,999 lb. add 1 1/2c. a lb.

### Magnesium

##### Segregated plant scrap

Pure solids and all other solids, exempt	
Borings and turnings	8.00

##### Mixed, contaminated plant scrap

Grade 1 solids	11.00
Grade 1 borings and turnings	7.00
Grade 2 solids	9.00
Grade 2 borings and turnings	5.00

For lots over 1499 lb. add 1c. per lb.

### Zinc

New zinc clippings, trimmings	7.25
Engravers', lithographers' plates	7.25
Old zinc scrap	5.75
Unswaged zinc dross	5.80
Die cast slab	5.80
New die cast scrap	4.95
Radiator grilles, old and new	4.95
Old die cast scrap	4.50

### Lead

Deduct 0.55c. a lb. from refined metal basing point prices for soft and hard lead inc. cable, for f.o.b. point of shipment price.

### Nickel

Ni content 98+%, Cu under 1/2%, 26c. per lb.; 90 to 98% Ni, 26c. per lb. contained Ni.

## ELECTROPLATING ANODES AND CHEMICALS

### Anodes

(Cents per lb., f.o.b. shipping point)

Copper: Cast, elliptical, 15 in. and longer	25 1/4
Electrolytic, full size	22 1/2
cut to size	30 1/4
Roller, oval, straight, 15 in. and longer	23 1/4
Curved	24 1/4
Brass: Cast, 82-20, elliptical, 15 in. and longer	23 1/4
Zinc: Cast, 99.99, 16 in. and over	16 1/4
Nickel: 99% plus, cast	47
Roller, depolarized	48
Silver: Roller, 999 fine per Troy (1-9) oz., per oz.	58

### Chemicals

(Cents per lb., delivery from New York)

Copper cyanide, tech., 100-lb. bbls. 1-5	5.65
Copper sulphate, 99.5 crystals, bbls.	13.00-13.50
Nickel salts, single, 425-lb. bbls.	34.00
Silver cyanide, 100 oz. lots	40.82-41.125
Sodium cyanide, 96% dom., 100-lb. dms.	0.15
Zinc cyanide, 100-lb. dms.	33.00
Zinc sulphate, 89% crystals, bbls.	6.80

# SCRAP

... News and Market Activities

## Vessel Scrap May Soon Flow to Yards

• • • Scrap operators who have been accustomed to receiving only ship fabrication scrap and a few junked parts from repair jobs may soon see whole hulls and mazes of broken machinery put at their disposal according to a joint agreement reached between the WPB, the War Shipping Administration, and MRC.

Hence forward, according to the agreement, all merchant ships which although seriously damaged are able to be towed to port, will be scrutinized by WSA to determine whether repair should be attempted under the present congested conditions of ship repair yards or whether reusable

equipment should be salvaged and the balance scrapped.

WPB will next determine whether the remaining scrap will bring the cost of its demolition and whether scrap needs warrant recovery of the materials. If scrapping can be accomplished even within a reasonable cost above scrap value, the Metals Reserve Corp. will take title to the hull and proceed with the demolition.

Consequently whole hulls, destroyed machinery and all parts of the vessels that cannot be used on other vessels are expected to start flowing to yards within a short time. No actual date for the start of this plan has yet been announced.

## Stocks Falling, Consumption Rises

• • • Domestic stocks of iron and steel scrap at consumer, supplier and producer plants at the end of August approximated 6,778,000 gross tons, representing a decrease of 1 per cent from the 6,860,000 tons reported on July 31, according to a statement released by the Bureau of Mines. This decline was attributable to decreases in consumer, and supplier and producer stocks of 1 and 2 per cent respectively. Thus, while consumer stocks on Aug. 31, amounted to 5,609,000 tons compared with 5,671,000 tons at the end of July, supplier and producer stocks were 1,169,000 tons and 1,189,000 tons, respectively. The majority of the decrease in total stocks was contributed by a decline of more than 1 per cent in stocks of purchased scrap at consumer plants (approximately 61,000 tons).

The total consumption of ferrous materials (scrap and pig iron) amounted to 9,306,000 gross tons in August, representing an increase of approximately 3 per cent over the 9,043,000 tons used in July. This increase was due to gains of 1, 4, and 3 per cent in the use of purchased scrap, home scrap, and pig iron, respectively. Despite the increase of 3 per cent in use of pig iron in August, stocks of this material increased 1 per cent; whereas, the increase of 1 per cent in the consumption of purchased scrap was reflected by a decline in stocks of purchased scrap at consumers'

plants, amounting to 1 per cent. Although the consumption of home scrap in August increased 4 per cent, stocks of this material remained approximately the same.

Consumption of scrap in August amounted to 4,686,000 gross tons, an increase of 3 per cent over the 4,570,000 tons used in July and at an annual rate of 5 per cent higher than in 1942.

## National Scrap Meeting Set for Cleveland, Jan. 12-13

Buffalo

• • • National directors of the Institute of Scrap Iron & Steel met in Buffalo on Oct. 20 as guests of the western New York Chapter and decided to hold the next national convention Jan. 12 and 13 in Cleveland.

Nathaniel H. Jacobs, vice-president of Buffalo Housewrecking and Salvage Co., was elected president of the chapter, succeeding Jay Risman of Morrison and Risman, Buffalo. Harry Markowitz of Syracuse was chosen vice-president and Leo Chapin of Buffalo was re-elected secretary and treasurer.

NEW YORK—General scrap situation here is very slow. Alloy scrap problem is growing worse each day. Mills and foundries supplied by this district have been

ordered to cease buying cast scrap so that it can be allocated to other districts facing a worse shortage of this grade.

PHILADELPHIA — Steel mills and foundries having sufficient inventories have been restricted by WPB from buying cast scrap. Several companies in this district that were taking charging box and heavy breakable cast have been stopped by this order. Declining scrap shipments are beginning to alarm mills here that until last week seemed apathetic.

BIRMINGHAM—The coal strike has caused an increased demand for open hearth grades of steel scrap, but has heavily reduced movement of blast furnace grades. The market for cast grades, dormant for months here, is showing a tendency to become more active.

BOSTON—A northeaster storm brought business to a standstill for 75 hr. the past week. Parts of many yards were under water. Most kinds of scrap are in short supply.

CINCINNATI—Although production of scrap is still in good volume, the supply of cast iron and steel scrap is limited.

ST. LOUIS—The situation at the steel mills is serious with consumption exceeding receipts. The WPB has recognized the shortage by allocating premium foundry grades instead of the regular melting grades to the open hearth mills. So far the mills have not been forced to reduce the melt.

BUFFALO—Scrap collectors delivered little material to the yards again this week but the situation was relieved a bit by the arrival of 3300 net tons from the New York City area via barge canal. There was no indication that battlefield scrap was in the lot, which was delivered to the leading consumer, whose reserves now are estimated as good for three weeks. Other consumers appear to be better fixed. Except for solid nickel, local mills are maintaining an embargo on alloy scrap.

PITTSBURGH—The market here was in a state of confusion this week. The effects of the coal strike sent demands for heavy melting steel and blast furnace grades sky high and far beyond the ability of brokers and dealers to meet them. Indications point towards an extremely tight scrap situation by December.

CHICAGO—The market continues to be extremely weak on alloy scrap prepared for electric furnace use, particularly in the triple alloys. An especially weak item is NE 8600.

# SCRAP PRICES

## IRON AND STEEL (OTHER THAN RAILROAD) SCRAP

(All Prices Are Per Gross Ton)

ELECTRIC FURNACE, ACID OPEN HEARTH AND FOUNDRY GRADES

(All Prices Are Per Gross Ton)																		
	BASIC OPEN HEARTH GRADES		BLAST FURNACE GRADES				Low Phos.	Heavy Structural and Plate			Foundry Steel					Alloy Free Low Phos. and Sulphur Turnings	Heavy Axle and Forge Turn. Electric Furnace Bundles	
	No. 1 & 2 Hvy. Melt. No. 1 Cp. Bk. Shs. No. 1 & 2 Bundles No. 1 Busheling	Unbale <sup>a</sup> Machine Shop Turnings	Mixed Borings and Turnings	Cast Iron Borings	Shovelling Turnings	No. 2 Busheling	Blillet, Bloom, Forge Crops	Bar Crops, Punchings, Plate Scrap and Cast Steel	3 ft. and Under	2 ft. and Under	1 ft. and Under	2 ft. and Under	1 ft. and Under	Auto. Springs, and Crank-shafts				
Pittsburgh, Brackenridge, Butler, Monessen, Midland, Johnstown, Sharon, Canton, Steubenville, Warren, Youngstown, Weirton, .....	\$20.00	\$15.00	\$15.00	16.00	\$17.00	\$17.50	\$25.00	\$22.50	\$21.50	\$22.00	\$22.50	\$21.50	\$22.00	\$21.00	\$21.50	\$18.00	\$19.50	\$21.00
Cleveland, Middletown, Cincinnati, Portsmouth, .....	19.50	14.50	14.50	15.50	16.50	17.00	24.50	22.00	21.00	21.50	22.00	21.00	21.50	20.50	20.50	17.50	19.00	20.50
Chicago, Claymont, Coatesville, Conshohocken, Harrisburg, Phoenixville, Sparrows Point, ..	18.75	13.75	13.75	14.75	15.75	16.25	23.75	21.25	20.25	20.75	21.25	20.25	20.75	19.75	19.75	16.75	18.25	19.75
Ashland, Ky., .....	19.50	14.50	14.50	15.50	16.50	17.00	24.50	22.00	21.00	21.50	22.00	21.00	21.50	20.50	20.50	17.50	19.00	20.50
Buffalo, N. Y., .....	19.25	14.25	14.25	15.25	16.25	16.75	24.25	21.75	20.75	21.25	21.75	20.75	21.25	20.25	20.25	17.25	18.75	20.25
Bethlehem, Pa.; Kokomo, Ind., ..	18.25	13.25	13.25	14.25	15.25	15.75	23.25	20.75	19.75	20.25	20.75	19.75	20.25	19.25	19.25	16.25	17.75	19.25
Duluth, Minn., .....	18.00	13.00	13.00	14.00	15.00	15.50	23.00	20.50	19.50	20.00	20.50	19.50	20.00	19.00	19.00	16.00	17.50	19.00
Detroit, Mich., .....	17.85	12.85	12.85	13.85	14.85	15.35	22.85	20.35	19.35	19.85	20.35	19.35	19.85	18.85	18.85	15.85	17.35	18.85
Toledo, Ohio, .....	17.50	12.50	12.50	13.50	14.50	15.00	22.50	20.00	19.00	19.50	20.00	19.00	19.50	18.50	18.50	15.50	17.00	18.50
St. Louis, Mo., .....	17.50	12.50	12.50	13.50	14.50	15.00	22.50	20.00	19.00	19.50	20.00	19.00	19.50	18.50	18.50	15.50	17.00	18.50
Atlanta, Ga.; Alabama City, Ala.; Birmingham, Los Angeles; Pittsburgh, Cal.; San Francisco	17.08	12.00	12.00	13.00	14.00	14.56	22.00	19.50	18.50	19.00	19.50	18.50	19.00	18.00	18.00	15.00	16.50	18.00
Minnequa, Colo., .....	16.50	11.50	11.50	12.50	13.50	14.00	21.50	19.00	18.00	18.50	19.00	18.00	18.50	17.50	17.50	14.50	16.00	17.50
Seattle, Wash., .....	14.50	9.50	9.50	10.50	11.50	12.00	19.50	17.00	16.00	16.50	17.00	16.00	16.50	15.00	15.00	12.50	14.00	15.50

<sup>a</sup>Baled turnings are \$5 per gross ton higher.

**BUNDLES:** Tin can bundles are \$4 below dealers' No. 2 bundles. No. 3 bundles are \$2 less than No. 1 heavy melting.

**AT NEW YORK CITY** or Brooklyn, the maximum shipping point price is \$15.33 for No. 1 heavy melting, f.o.b. cars, f.a.s. vessel or loaded on truck. Minimum set at \$14 per gross ton at any shipping point in U. S. Other grades carry differentials similar to those in table. New Jersey prices must be computed on basis of all-rail. At Boston the maximum is \$15.05 for No. 1 f.o.b. cars, f.a.s. vessel or loaded on trucks. Shipments from a New England shipping point to a consumer outside New England carry maximum transportation charge of \$6.66 per ton.

**SWITCHING CHARGES:** Deductions for shipping points within basing points (cents per gross ton) are: Pittsburgh, Brackenridge, 55c.; Midland, Johnstown, Sharon, Youngstown, Warren, Weirton, Cleveland, Toledo, Los Angeles, San Francisco, 42c.; Butler, Monessen, Canton, Steubenville, Cincinnati\*, Portsmouth, Ashland, Coatesville, Harrisburg, Phoenixville, Bethlehem, Kokomo, Duluth, St. Louis, 28c.; Buffalo, Claymont, 36c.; Conshohocken, 11c.; Atlanta, Birmingham, 32c.; Pittsburgh, Cal., 42c.; Middletown, 14c.; Sparrow's Point, 11c.; Chicago, 84c.; Detroit, 53c.; Alabama City, 26c.; Minnequa, 22c.; Seattle, 38c. \*At Cincinnati, for basic open hearth grades, foundry steel and auto springs and crankshafts, deduct 80c. per ton.

**PITTSBURGH** basing point includes switching districts of Bessemer, Homestead, Duquesne, Munhall and McKeesport. Cincinnati basing point includes Newport, Ky., switching district. St. Louis includes switching districts of Granite City, East St. Louis, Madison, Ill. San Francisco includes switching districts of S. San Francisco, Niles and Oakmont, Cal. Claymont, Del., includes the switching point of Chester, Pa. Chicago includes Gary, Ind., switching district.

**MAXIMUM SHIPPING POINT PRICE**—Where shipment is by rail or vessel, or by combination of rail and vessel, the scrap is at its shipping point when placed f.o.b. railroad or f.a.s. vessel. In such cases, the maximum shipping point prices shall be: (a) For shipping points located within a basing point, the price listed in the table above

for the scrap at the basing point in which the shipping point is located, minus the lowest established switching charge for scrap within the basing point and (b) for shipping points located outside the basing point, the price in table above at the most favorable basing point minus the lowest transportation charge by rail or water or combination thereof. In lieu of dock charge add 75c. a ton\*, but 50c. if moved by deck scow or railroad lighter. Shipping by motor vehicle: The scrap is at its shipping point when loaded. For shipping points located within basing points take price listed in table minus applicable switching charge. If located outside a basing point, the price at the most favorable basing point minus lowest established charge for transporting by common carrier. If no established transportation rate exists, the customary costs are deducted. Published dock charges prevail. If unpublished include 75c.\* For exceptions see official order.

**UNPREPARED SCRAP:** For unprepared scrap, maximum price shall be \$3.50 (and in the case of the material from which No. 1, No. 2, and No. 3 bundles are made \$4) less maximum prices for the corresponding grade or grades of prepared scrap. In no case, however, shall electric furnace and foundry grades be used as the "corresponding grade or grades of prepared scrap." Converter may charge \$2.50 per ton on consumer-owned unprepared remote scrap (see order). A preparation-in-transit charge for allocated unprepared scrap is provided.

**NEW LISTED GRADES:** Priced in dollars per gross ton less than No. 1 heavy melting steel. Pit scrap, ladle skulls, slag reclaim, etc., of 85% or more Fe priced—\$2; 75 to 85% Fe—\$4; under 75% Fe—\$8 per ton. Mill scale of 65% or more Fe—\$8 per ton. Mill cinder and grindings, shipping point maximum price of \$4 per gross ton at all U. S. shipping points.

**CHEMICAL BORINGS:** No. 1 (new, clean, containing not more than 1 per cent oil), \$1 less than No. 1 heavy melting; No. 2 (new, clean, containing not more than 1.5 per cent oil), \$2 less than No. 1 heavy melting. If loaded in box cars add 75c.

\*At Memphis 50c.; Great Lakes ports \$1; New England \$1.25.

### RAILROAD SCRAP

	Scrap Rails			Scrap Rails		
	No. 1 RR Heavy Melting	Scrap Rail	Rails for Reroiling	3 ft. and Under	2 ft. and Under	18 in. and Under
Cleveland, Cincinnati, Ashland, Portsmouth, Middletown, Canton, Pittsburgh, Sharon, Steubenville, Wheeling, Youngstown, Chicago, Philadelphia, Sparrows Pt., Wilmington, Birmingham, Los Angeles, San Francisco, Buffalo, Detroit, Duluth, Kansas City, Mo., Kokomo, Ind., Seattle, St. Louis.	\$20.50 21.00 19.75 18.00 20.25 18.85 19.00 17.00 19.25 15.50 18.50	\$21.50 22.00 20.75 19.00 21.25 19.85 20.00 18.00 20.25 16.50 19.50	\$23.00 23.50 22.25 20.50 22.75 21.35 21.50 19.50 21.75 18.00 21.00	\$23.50 24.00 22.75 21.00 22.75 21.85 22.00 20.00 22.25 18.50 21.50	\$23.75 24.25 23.00 21.25 23.00 22.10 22.25 20.25 22.50 18.75 21.75	\$24.00 24.50 23.25 21.50 23.25 22.30 22.50 20.50 22.75 19.00 22.00

### CAST IRON SCRAP

	Group A	Group B	Group C
No. 1 cupola cast.....	\$18.00	\$19.00	\$20.00
Clean auto cast.....	18.00	19.00	20.00
Unstripped motor blocks.....	15.50	16.50	17.50
Stove Plate.....	17.00	18.00	19.00
Heavy Breakable Cast.....	15.50	16.50	17.50
Charging Box Size Cast.....	17.00	18.00	19.00
Misc. Malleable.....	20.00	21.00	22.00

Group A includes the states of Montana, Idaho, Wyoming, Nevada, Utah, Arizona and New Mexico.

Group B includes the states of North Dakota, South Dakota, Nebraska, Colorado, Kansas, Oklahoma, Texas and Florida.

Group C: States not named in A and B; switching district of Kansas City, Kan., Mo.

## Tool Steel Scrap Ceiling Prices Set by MPR 379, May 4, 1943

BASE PRICE SEGREGATED			BASE PRICE UNSEGREGATED SOLIDS		BASE PRICE UNSEGREGATED TURNINGS	
Type	Solids, Lb. Cont. W	Turnings, Lb. Cont. W				
Type 1.....	\$1.80	\$1.60	\$1.50 per lb. contained W if 5% or more.		\$1.30 per lb. contained W if 5% or more.	
Type 2.....	1.60	1.40	\$1.15 per lb. contained W if over 1% and less than 5%.		\$1.00 per lb. contained W if 1% and less than 5%.	
Type 3.....	1.25	1.25	\$0.80 per lb. contained Mo if 1½% or more.		\$0.70 per lb. contained Mo if 1½% or more.	
Type 4.....	0.125	0.105				
Type 5.....	0.135	0.115				

<sup>a</sup>Per lb. of scrap material.

# Comparison of Prices . . .

Advances Over Past Week in **Heavy Type**; Declines in *Italics*.

[Prices Are F.O.B. Major Basing Points]

Flat Rolled Steel: (Cents Per Lb.)	Oct. 26, 1943	Oct. 19, 1943	Sept. 28, 1943	Oct. 27, 1942
Hot rolled sheets.....	2.10	2.10	2.10	2.10
Cold rolled sheets.....	3.05	3.05	3.05	3.05
Galvanized sheets (24 ga.)	3.50	3.50	3.50	3.50
Hot rolled strip.....	2.10	2.10	2.10	2.10
Cold rolled strip.....	2.80	2.80	2.80	2.80
Plates.....	2.10	2.10	2.10	2.10
Plates, wrought iron.....	3.80	3.80	3.80	3.80
Stain's c.r. strip (No. 302)	28.00	28.00	28.00	28.00

Tin and Terne Plate: (Dollars Per Base Box)	Oct. 26, 1943	Oct. 19, 1943	Sept. 28, 1943	Oct. 27, 1942
Tin plate, standard cokes	\$5.00	\$5.00	\$5.00	\$5.00
Tin plate, electrolytic...	4.50	4.50	4.50	4.50
Special coated mfg. ternes	4.30	4.30	4.30	4.30

Bars and Shapes: (Cents Per Lb.)	Oct. 26, 1943	Oct. 19, 1943	Sept. 28, 1943	Oct. 27, 1942
Merchant bars.....	2.15	2.15	2.15	2.15
Cold finished bars.....	2.65	2.65	2.65	2.65
Alloy bars.....	2.70	2.70	2.70	2.70
Structural shapes.....	2.10	2.10	2.10	2.10
Stainless bars (No. 302)...	24.00	24.00	24.00	24.00
Wrought iron bars.....	4.40	4.40	4.40	4.40

Wire and Wire Products: (Cents Per Lb.)	Oct. 26, 1943	Oct. 19, 1943	Sept. 28, 1943	Oct. 27, 1942
Plain wire.....	2.60	2.60	2.60	2.60
Wire nails.....	2.55	2.55	2.55	2.55

Rails: (Dollars Per Gross Ton)	Oct. 26, 1943	Oct. 19, 1943	Sept. 28, 1943	Oct. 27, 1942
Heavy rails.....	\$40.00	\$40.00	\$40.00	\$40.00
Light rails.....	40.00	40.00	40.00	40.00

Semi-Finished Steel: (Dollars Per Gross Ton)	Oct. 26, 1943	Oct. 19, 1943	Sept. 28, 1943	Oct. 27, 1942
Rerolling billets.....	\$34.00	\$34.00	\$34.00	\$34.00
Sheet bars.....	34.00	34.00	34.00	34.00
Slabs.....	34.00	34.00	34.00	34.00
Forging billets.....	40.00	40.00	40.00	40.00
Alloy blooms, billets, slabs	54.00	54.00	54.00	54.00

Wire Rods and Skelp: (Cents Per Lb.)	Oct. 26, 1943	Oct. 19, 1943	Sept. 28, 1943	Oct. 27, 1942
Wire rods.....	2.00	2.00	2.00	2.00
Skelp (grv'd).....	1.90	1.90	1.90	1.90

The various basing points for finished and semi-finished steel are listed in the detailed price tables, pages 145-159.

Pig Iron: (Per Gross Ton)	Oct. 26, 1943	Oct. 19, 1943	Sept. 28, 1943	Oct. 27, 1942
No. 2 fdy., Philadelphia...	\$25.84	\$25.84	\$25.89	\$25.89
No. 2, Valley furnace....	24.00	24.00	24.00	24.00
No. 2, Southern Cin'ti...	24.68	24.68	24.68	24.68
No. 2, Birmingham.....	20.38	20.38	20.38	20.38
No. 2, foundry, Chicago†	24.00	24.00	24.00	24.00
Basic, del'd eastern Pa...	25.39	25.39	25.39	25.39
Basic, Valley furnace....	23.50	23.50	23.50	23.50
Malleable, Chicago†....	24.00	24.00	24.00	24.00
Malleable, Valley.....	24.00	24.00	24.00	24.00
L. S. charcoal, Chicago...	31.34	31.34	31.34	31.34
Ferromanganese†.....	135.00	135.00	135.00	135.00

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.  
‡For carlots at seaboard.

Scrap: (Per Gross Ton)	Oct. 26, 1943	Oct. 19, 1943	Sept. 28, 1943	Oct. 27, 1942
Heavy melt'g steel, P'gh.	\$20.00	\$20.00	\$20.00	\$20.00
Heavy melt'g steel, Phila.	18.75	18.75	18.75	18.75
Heavy melt'g steel, Ch'go	18.75	18.75	18.75	18.75
No. 1 hy. comp. sheet, Det.	17.85	17.85	17.85	17.85
Low phos. plate, Youngs'n	22.50	22.50	22.50	22.50
No. 1 cast, Pittsburgh...	20.00	20.00	20.00	20.00
No. 1 cast, Philadelphia.	20.00	20.00	20.00	20.00
No. 1 cast, Ch'go.....	20.00	20.00	20.00	20.00

Coke, Connellsville: (Per Net Ton at Oven)	Oct. 26, 1943	Oct. 19, 1943	Sept. 28, 1943	Oct. 27, 1942
Furnace coke, prompt...	\$6.50	\$6.50	\$6.50	\$6.00
Foundry coke, prompt...	7.50	7.375	6.875	6.875

Non-Ferrous Metals: (Cents per Lb. to Large Buyers)	Oct. 26, 1943	Oct. 19, 1943	Sept. 28, 1943	Oct. 27, 1942
Copper, electro., Conn...	12.00	12.00	12.00	12.00
Copper, Lake, New York.	12.00	12.00	12.00	12.00
Tin (Straits), New York.	52.00	52.00	52.00	52.00
Zinc, East St. Louis.....	8.25	8.25	8.25	8.25
Lead, St. Louis.....	6.35	6.35	6.35	6.35
Aluminum, Virgin, del'd.	15.00	15.00	15.00	15.00
Nickel, electrolytic.....	35.00	35.00	35.00	35.00
Magnesium, ingot.....	20.50	20.50	20.50	22.50
Antimony (Asiatic), N. Y.	16.50	16.50	16.50	16.50

## Composite Prices . . .

FINISHED STEEL	
Oct. 26, 1943.....	2.25513c. a Lb.....
One week ago.....	2.25513c. a Lb.....
One month ago.....	2.25513c. a Lb.....
One year ago.....	2.26190c. a Lb.....

HIGH		LOW	
1943.....	2.25513c.,	2.25513c.,	
1942.....	2.26190c.,	2.26190c.,	
1941.....	2.43078c.,	2.43078c.,	
1940.....	2.30467c., Jan. 2	2.24107c., Apr. 16	
1939.....	2.35367c., Jan. 3	2.26689c., May 16	
1938.....	2.58414c., Jan. 4	2.27207c., Oct. 18	
1937.....	2.58414c., Mar. 9	2.32263c., Jan. 4	
1936.....	2.32263c., Dec. 28	2.05200c., Mar. 10	
1935.....	2.07642c., Oct. 1	2.06492c., Jan. 8	
1934.....	2.15367c., Apr. 24	1.95757c., Jan. 2	
1933.....	1.95578c., Oct. 3	1.75836c., May 2	
1932.....	1.89196c., July 5	1.83901c., Mar. 1	
1931.....	1.99626c., Jan. 13	1.86586c., Dec. 29	
1930.....	2.25488c., Jan. 7	1.97319c., Dec. 9	
1929.....	2.31773c., May 28	2.26498c., Oct. 29	

Weighted index based on steel bars, beams, tank plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 73 per cent of the United States output. Index recapitulated in Aug. 28, 1941, issue.

PIG IRON	
.....	23.61 a Gross Ton.....
.....	23.61 a Gross Ton.....
.....	23.61 a Gross Ton.....
.....	23.61 a Gross Ton.....

HIGH		LOW	
.....	\$23.61	\$23.61	
.....	23.61	23.61	
20	\$23.61, Mar. 20	\$23.45, Jan. 2	
23	23.45, Dec. 23	22.61, Jan. 2	
19	22.61, Sept. 19	20.61, Sept. 12	
21	23.25, June 21	19.61, July 6	
9	23.25, Mar. 9	20.25, Feb. 16	
24	19.74, Nov. 24	18.73, Aug. 11	
5	18.84, Nov. 5	17.83, May 14	
1	17.90, May 1	16.90, Jan. 27	
5	16.90, Dec. 5	13.56, Jan. 3	
5	14.81, Jan. 5	13.56, Dec. 6	
6	15.90, Jan. 6	14.79, Dec. 15	
7	18.21, Jan. 7	15.90, Dec. 16	
14	18.71, May 14	18.21, Dec. 17	

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

SCRAP STEEL	
.....	\$19.17 a Gross Ton.....
.....	\$19.17 a Gross Ton.....
.....	\$19.17 a Gross Ton.....
.....	\$19.17 a Gross Ton.....

HIGH		LOW	
.....	\$19.17	\$19.17	
.....	19.17	19.17	
7	\$22.00, Jan. 7	\$19.17, Apr. 10	
30	21.83, Dec. 30	16.04, Apr. 9	
3	22.50, Oct. 3	14.08, May 16	
22	15.00, Nov. 22	11.00, June 7	
30	21.92, Mar. 30	12.67, June 9	
21	17.75, Dec. 21	12.67, June 9	
10	13.42, Dec. 10	10.33, Apr. 29	
13	13.00, Mar. 13	9.50, Sept. 25	
8	12.25, Aug. 8	6.75, Jan. 3	
12	8.50, Jan. 12	6.43, July 5	
6	11.33, Jan. 6	8.50, Dec. 29	
18	15.00, Feb. 18	11.25, Dec. 9	
29	17.58, Jan. 29	14.08, Dec. 3	

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

# Prices of Finished Iron and Steel

Steel prices shown here are f.o.b. basing points, in cents per lb., unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, mutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, reductions, and in most cases freight absorbed to meet competition. Delivered prices do not reflect new 3 per cent tax on freight rates.

Basing Point ↓ Product												10 DELIVERED TO			
	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio	Gulf Ports, Cars	Pacific Ports, Cars	Detroit	New York	Phila- delphia
<b>SHEETS</b>															
Hot rolled	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.20¢	2.10¢		2.65¢	2.20¢	2.34¢	2.27¢
Cold rolled <sup>1</sup>	3.05¢	3.05¢	3.05¢	3.05¢		3.05¢	3.05¢		3.15¢	3.05¢		3.70¢	3.15¢	3.39¢	3.37¢
Galvanized (24 ga.)	3.50¢	3.50¢	3.50¢		3.50¢	3.50¢	3.50¢	3.50¢	3.60¢	3.50¢		4.05¢		3.74¢	3.67¢
Enameling (20 ga.)	3.35¢	3.35¢	3.35¢	3.35¢			3.35¢		3.45¢	3.35¢		4.00¢	3.45¢	3.71¢	3.67¢
Long ternes <sup>2</sup>	3.80¢		3.80¢									4.55¢		4.16¢	4.12¢
<b>STRIP</b>															
Hot rolled <sup>3</sup>	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢			2.10¢		2.75¢	2.20¢	2.46¢	
Cold rolled <sup>4</sup>	2.80¢	2.90¢		2.80¢			2.80¢		(Worcester = 3.00¢)				2.90¢	3.16¢	
Cooperage stock	2.20¢	2.20¢			2.20¢		2.20¢							2.56¢	
Commodity C-R	2.95¢	3.05¢		2.95¢			2.95¢		(Worcester = 3.35¢)				3.05¢	3.31¢	
<b>TIN MILL PRODUCTS</b>															
Coke tin plate, base box	\$5.00	\$5.00	\$5.00						\$5.10					5.36¢	5.32¢
.50 } Electro tin plate, box	\$4.50	\$4.50	\$4.50												
	\$4.65		\$4.65												
Black plate, 29 gage <sup>5</sup>	3.05¢	3.05¢	3.05¢						3.15¢			4.05¢ <sup>12</sup>			3.37¢
Mfg. ternes, special box	\$4.30	\$4.30	\$4.30						\$4.40						
<b>BARS</b>															
Carbon steel	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			(Duluth = 2.25¢)		2.50¢	2.80¢	2.25¢	2.49¢	2.47¢
Rail steel <sup>6</sup>	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢					2.50¢	2.80¢			
Reinforcing (billet) <sup>7</sup>	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.50¢	2.55¢ <sup>13</sup>	2.25¢	2.39¢	
Reinforcing (rail) <sup>7</sup>	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢				2.50¢	2.55¢ <sup>13</sup>	2.25¢		2.47¢
Cold finished <sup>8</sup>	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢			(Detroit = 2.70¢)					2.99¢	2.97¢
Alloy, hot rolled	2.70¢	2.70¢				2.70¢			(Bethlehem, Massillon, Canton = 2.70¢)				2.80¢		
Alloy, cold drawn	3.35¢	3.35¢	3.35¢	3.35¢		3.35¢							3.45¢		
									(Coatesville and Claymont = 2.10¢)						
<b>PLATES</b>															
Carbon steel	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢	2.35¢		2.45¢	2.65¢	2.31¢	2.29¢	2.15¢
Floor plates	3.35¢	3.35¢									3.70¢	4.00¢		3.71¢	3.67¢
Alloy	3.50¢	3.50¢							(Coatesville = 3.50¢)		3.95¢	4.15¢		3.70¢	3.59¢
<b>SHAPES</b>															
Structural	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢			(Bethlehem = 2.10¢)		2.45¢	2.75¢		2.27¢	2.215¢
<b>SPRING STEEL, C-R</b>															
0.26 to 0.50 Carbon	2.80¢			2.80¢					(Worcester = 3.00¢)						
0.51 to 0.75 Carbon	4.30¢			4.30¢					(Worcester = 4.50¢)						
0.76 to 1.00 Carbon	6.15¢			6.15¢					(Worcester = 6.35¢)						
1.01 to 1.25 Carbon	8.35¢			8.35¢					(Worcester = 8.55¢)						
<b>WIRE<sup>9</sup></b>															
Bright <sup>10</sup>	2.60¢	2.60¢		2.60¢	2.60¢				(Worcester = 2.70¢)			3.10¢			2.92¢
Galvanized															
add proper size extra and galvanized extra to bright wire base, above.															
Spring (High Carbon)	3.20¢	3.20¢		3.20¢					(Worcester = 3.30¢)			3.70¢			3.52¢
<b>PILING</b>															
Steel sheet	2.40¢	2.40¢				2.40¢						2.95¢			2.72¢

<sup>1</sup> Mill run sheets are 10c per 100 lb. less than base; and primes only, 25c. above base. <sup>2</sup> Unassorted 8-lb. coating. <sup>3</sup> Widths up to 12 in. <sup>4</sup> Carbon 0.25 per cent and less. <sup>5</sup> Applies to certain width and length limitations. <sup>6</sup> For merchant trade. <sup>7</sup> Prices for straight length material only, from a producer to a consumer. Functional discount of 25c. per 100 lb. to fabricators. <sup>8</sup> Also shafting. For quantities of 20,000 to 29,999 lb. <sup>9</sup> Carload lot to manufacturing trade. <sup>10</sup> These prices do not apply if the customary means of transportation (rail and water) are not used. <sup>11</sup> Boxed. <sup>12</sup> Portland and Seattle price, San Francisco price is 2.50c. <sup>13</sup> This bright wire base price to be used in figuring annealed and bright finish wires, commercial spring wire and galvanized wire.

GOVERNMENT CEILING—Price Schedule No. 6 issued April 16, 1941, governs steel mill prices; Price Schedule No. 49 governs warehouse prices which are on another page of this issue.

EXCEPTIONS TO PRICE SCHEDULE No. 6—On hot rolled carbon bars, Phoenix Iron Co. may quote 2.35c. at established basing points, Calumet Steel division of Borg Warner may quote 2.35c., Chicago, on bars from its 8-in. mill; Joslyn Mfg. Co. may quote 2.35c., Chicago base. On rail steel bars Sweets Steel Co. may quote 2.35c., f.o.b. mill. On hot rolled sheets, Andrews Steel Co. may quote for shipment to Detroit area on Middletown base; Parkersburg Iron & Steel may quote \$2.25 per hundred f.o.b. Parkersburg, W. Va. On galvanized sheets, Andrews Steel may quote 3.75c., at established basing points; Parkersburg Iron & Steel may quote \$3.85 per hundred f.o.b. Parkersburg, W. Va. On hot rolled strip, Joslyn Mfg. Co. may quote 2.30c., Chicago base. On plates, Granite City Steel Co. may quote 2.35c., f.o.b. mill, and Central Iron & Steel Co. may quote 2.20c., f.o.b. basing points. On shapes, Phoenix Iron Co. may quote 2.30c. established basing points and 2.50c. Phoenixville for export.

On rail steel merchant bars, Eckels-Nye Corp. may charge 2.40c. On tubing, South Chester Tube Co. may price Gulf or Pacific Coast all-rail shipments and shipments west of Harrisburg on basis of f.o.b. Chester. On lend-lease sales to eastern seaboard, Sheffield Steel Co. and Colorado Fuel & Iron Corp. may sell f.o.b. mill. SEMIFINISHED STEEL—Follansbee Steel Corp. may sell forging billets at \$40.50 f.o.b. Toronto; Continental Steel Corp. may sell Acme Steel Co. at \$34 for rerolling billets plus extras and freight; Ford Motor Co. may sell rerolling billets at \$34 f.o.b. Dearborn; Andrews Steel Co. may sell forging billets at \$50 at established basing points and slabs at \$41; Empire Sheet and Tin Plate may sell slabs at \$41 at established basing points and sheet bars at \$39 f.o.b. mill; on lend-lease sales Northwestern Steel & Wire Co. may charge \$41 per gross ton f.o.b. mill for rerolling billets; on lend-lease sales Wheeling Steel Corp. may charge \$36 per ton for small billets, f.o.b. Portsmouth and \$37 per ton for sheet bars f.o.b. Portsmouth; Laclede Steel Co. on semi-finished sales for lend-lease shipped to eastern seaboard may use Chicago basing point prices f.o.b. Alton and Madison, Ill. ALLOY STEEL BARS—Texas Steel Co. may use Chicago base f.o.b. Fort Worth.

# PRICES

## WAREHOUSE PRICES

(Delivered Metropolitan areas, per 100 lb. These prices do not necessarily apply for dislocated tonnage shipments when the f.o.b. City prices are used in conformance with OPA Schedule 19)

Cities	SHEETS			STRIP		Plate 1/4 In. and heavier	Structural Shapes	BARS		ALLOY BARS			
	Hot Rolled (10 gage)	Cold Rolled	Galvanized (24 gage)	Hot Rolled	Cold Rolled			Hot Rolled	Cold Finished	†† Hot Rolled, 2300	† Hot Rolled, 3100	†† Cold Drawn, 2300	† Cold Drawn, 3100
*Philadelphia.....	\$3.518	\$4.872 <sup>5</sup>	\$5.018	\$3.922	\$4.772	\$3.606	\$3.666	\$3.822	\$4.072	.....	\$7.116	.....	.....
*New York.....	3.590	4.613 <sup>2</sup>	5.010	3.974 <sup>6</sup>	4.774	3.768	3.758	3.853	4.103	6.008	7.158	7.303	8.453
*Boston.....	3.774	4.744	5.224	4.106	4.715	3.912	3.912	4.044	4.144	6.162	7.312	7.344	8.494
*Baltimore.....	3.394	4.852	4.894	3.902	4.752	3.594	3.759	3.802	4.052	.....	.....	.....	.....
*Norfolk.....	3.771	4.965	5.371	4.165	4.865	3.971	4.002	4.065	4.165	.....	.....	.....	.....
*Washington.....	3.596	4.841	5.196	4.041	4.741	3.796	3.930	3.941	4.041	.....	.....	.....	.....
*Chicago.....	3.25	4.20	5.23 <sup>4</sup>	3.60	4.65 <sup>8</sup>	3.55	3.55	3.50	3.75	5.75	6.90	6.85	8.00
*Milwaukee.....	3.387	4.337 <sup>2</sup>	5.272 <sup>4</sup>	3.737	4.787 <sup>8</sup>	3.687	3.687	3.637	3.887	5.987	7.137	7.087	8.237
*Cleveland.....	3.35	4.40	4.877 <sup>4</sup>	3.60	4.45	3.40	3.588	3.35	3.75	5.956	7.106	6.85	8.00
*Buffalo.....	3.35	4.40	4.75 <sup>4</sup>	3.819	4.669	3.63	3.40	3.35	3.75	5.75	6.90	6.85	8.00
*Detroit.....	3.45	4.50	5.00 <sup>4</sup>	3.70	5.909 <sup>8</sup>	3.609	3.661	3.45	3.80	6.08	7.23	7.159	8.309
*Cincinnati.....	3.425	4.475 <sup>2</sup>	4.825 <sup>1</sup>	3.675	4.711	3.611	3.691	3.611	4.011	.....	.....	.....	.....
*St. Louis.....	3.397	4.247 <sup>2</sup>	5.172 <sup>4</sup>	3.747	4.931 <sup>8</sup>	3.697	3.697	3.647	4.031	6.131	7.281	7.231	8.381
*Pittsburgh.....	3.35	4.40	4.75	3.60	4.45	3.40	3.40	3.35	3.75	5.75	7.15	6.85	8.25
*St. Paul.....	3.51	4.46	5.257 <sup>4</sup>	3.86	4.35 <sup>8</sup>	3.81 <sup>9</sup>	3.81 <sup>9</sup>	3.76 <sup>9</sup>	4.361	6.09	7.24	7.561	8.711
*Omaha.....	3.665	5.443	5.608 <sup>4</sup>	4.215	.....	4.165	4.165	4.115	4.443	.....	.....	.....	.....
*Indianapolis.....	3.58	3.58	4.568	4.918	3.768	4.78	3.63	3.58	3.98	6.08	7.23	7.18	8.33
*Birmingham.....	3.45	.....	4.75	3.70	.....	3.55	3.55	3.50	4.43	.....	.....	.....	.....
*Memphis.....	3.85	4.66	5.25	4.10	.....	3.95	3.95	3.90	4.31	.....	.....	.....	.....
*New Orleans.....	3.95	4.95	5.25	4.20	.....	3.90	3.90	4.10	4.60	.....	.....	.....	.....
Houston.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
†Los Angeles.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
†San Francisco.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
†Seattle.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

## NATIONAL EMERGENCY (N. E.) STEELS (Hot Rolled Mill Extras for Alloy Content)

Designation	CHEMICAL COMPOSITION LIMITS, PER CENT							Basic Open-Hearth		Electric Furnace			
	Carbon	Manganese	Phosphorus Max.	Sulfur Max.	Silicon	Chromium	Nickel	Molybdenum	Bars and Bar Strip	Billets, Blooms and Slabs	Bars and Bar Strip	Billets, Blooms and Slabs	
NE 1330	.28/.33	1.60/1.90	.040	.040	.20/.35				.10c	\$2.00			
NE 1335	.33/.38	1.60/1.90	.040	.040	.20/.35				.10	2.00			
NE 1340	.38/.43	1.60/1.90	.040	.040	.20/.35				.10	2.00			
NE 1345	.43/.48	1.60/1.90	.040	.040	.20/.35				.10	2.00			
NE 1350	.48/.53	1.60/1.90	.040	.040	.20/.35				.10	2.00			
NE 8613	.12/.17	.70/.90	.040	.040	.20/.35	.40/.60	.40/.70	.15/.25	.75	15.00	1.25	25.00	
NE 8615	.13/.18	.70/.90	.040	.040	.20/.35	.40/.60	.40/.70	.15/.25	.75	15.00	1.25	25.00	
NE 8617	.15/.20	.70/.90	.040	.040	.20/.35	.40/.60	.40/.70	.15/.25	.75	15.00	1.25	25.00	
NE 8620	.18/.23	.70/.90	.040	.040	.20/.35	.40/.60	.40/.70	.15/.25	.75	15.00	1.25	25.00	
NE 8630	.28/.33	.70/.90	.040	.040	.20/.35	.40/.60	.40/.70	.15/.25	.75	15.00	1.25	25.00	
NE 8635	.33/.38	.75/1.00	.040	.040	.20/.35	.40/.60	.40/.70	.15/.25	.75	15.00	1.25	25.00	
NE 8637	.35/.40	.75/1.00	.040	.040	.20/.35	.40/.60	.40/.70	.15/.25	.75	15.00	1.25	25.00	
NE 8640	.38/.43	.75/1.00	.040	.040	.20/.35	.40/.60	.40/.70	.15/.25	.75	15.00	1.25	25.00	
NE 8642	.40/.45	.75/1.00	.040	.040	.20/.35	.40/.60	.40/.70	.15/.25	.75	15.00	1.25	25.00	
NE 8645	.43/.48	.75/1.00	.040	.040	.20/.35	.40/.60	.40/.70	.15/.25	.75	15.00	1.25	25.00	
NE 8650	.48/.53	.75/1.00	.040	.040	.20/.35	.40/.60	.40/.70	.15/.25	.75	15.00	1.25	25.00	
NE 6720	.18/.23	.70/.90	.040	.040	.20/.35	.40/.60	.40/.70	.20/.30	.80	16.00	1.30	26.00	
NE 9255	.50/.60	.70/.95	.040	.040	1.80/2.20				.40	8.00			
NE 9260	.55/.65	.70/1.00	.040	.040	1.80/2.20				.40	8.00			
NE 9261	.55/.65	.70/1.00	.040	.040	1.80/2.20	.10/.25			.65	13.00			
NE 9262	.55/.65	.70/1.00	.040	.040	1.80/2.20	.25/.40			.65	13.00			
NE 9415	.13/.18	.80/1.10	.040	.040	.20/.35	.30/.50	.30/.60	.08/.15	.75	15.00	1.25	25.00	
NE 9420	.18/.23	.80/1.10	.040	.040	.20/.35	.30/.50	.30/.60	.08/.15	.75	15.00	1.25	25.00	
NE 9422	.20/.25	.80/1.10	.040	.040	.20/.35	.30/.50	.30/.60	.08/.15	.75	15.00	1.25	25.00	
NE 9425	.23/.28	.80/1.10	.040	.040	.20/.35	.30/.50	.30/.60	.08/.15	.75	15.00	1.25	25.00	
NE 9430	.28/.33	.90/1.20	.040	.040	.20/.35	.30/.50	.30/.60	.08/.15	.75	15.00	1.25	25.00	
NE 9435	.33/.38	.90/1.20	.040	.040	.20/.35	.30/.50	.30/.60	.08/.15	.75	15.00	1.25	25.00	
NE 9437	.35/.40	.90/1.20	.040	.040	.20/.35	.30/.50	.30/.60	.08/.15	.75	15.00	1.25	25.00	
NE 9440	.38/.43	.90/1.20	.040	.040	.20/.35	.30/.50	.30/.60	.08/.15	.75	15.00	1.25	25.00	
NE 9442	.40/.45	1.00/1.30	.040	.040	.20/.35	.30/.50	.30/.60	.08/.15	.80	16.00	1.30	26.00	
NE 9445	.43/.48	1.00/1.30	.040	.040	.20/.35	.30/.50	.30/.60	.08/.15	.80	16.00	1.30	26.00	
NE 9450	.48/.53	1.20/1.50	.040	.040	.20/.35	.30/.50	.30/.60	.08/.15	.80	16.00	1.30	26.00	
NE 9537 <sup>o</sup>	.35/.40	1.20/1.50	.040	.040	.40/.60	.40/.60	.40/.70	.15/.25	1.20	24.00	1.70	34.00	
NE 9540 <sup>o</sup>	.38/.43	1.20/1.50	.040	.040	.40/.60	.40/.60	.40/.70	.15/.25	1.20	24.00	1.70	34.00	
NE 9542 <sup>o</sup>	.40/.45	1.20/1.50	.040	.040	.40/.60	.40/.60	.40/.70	.15/.25	1.20	24.00	1.70	34.00	
NE 9545 <sup>o</sup>	.43/.48	1.20/1.50	.040	.040	.40/.60	.40/.60	.40/.70	.15/.25	1.20	24.00	1.70	34.00	
NE 9550 <sup>o</sup>	.48/.53	1.20/1.50	.040	.040	.40/.60	.40/.60	.40/.70	.15/.25	1.20	24.00	1.70	34.00	

BASE QUANTITIES: Hot rolled sheets, cold rolled sheets, hot rolled strip, plates, shapes and hot rolled bars, 400 to 1999 lb.; galvanized sheets, 150 to 1499 lb.; cold rolled strip, extras apply on all quantities; cold finished bars, 1500 lb. and over; SAE bars, 1000 lb. and over: Exceptions: <sup>1</sup> 500 to 1499 lb. <sup>2</sup> 400 to 1499 lb. <sup>3</sup> 400 to 1999 lb. <sup>4</sup> 450 to 1499 lb. <sup>5</sup> 1000 to 1999 lb. <sup>6</sup> 0 to 1999 lb. <sup>7</sup> 300 to 10,000 lb. <sup>8</sup> 2000 to 39,999 lb. <sup>9</sup> 400 to 14,999 lb. At Philadelphia galvanized sheets, 2500 more bundles; Boston, cold rolled and galvanized sheets, 450 to 3749 lb.; San Francisco, hot rolled sheets, 400 to 39,999 lb.; galvanized and cold rolled sheets, 750 to 4999 lb.; cold fin. bars, 0-299 lb.; hot rolled alloy bars, 0-4999 lb.; Seattle, cold finished bars, 1000 lb. and over, hot rolled alloy bars, 0-1999 lb.; Memphis, hot rolled sheets, 400 to 1999 lb., galvanized sheets, 150 and over; Los Angeles, hot rolled sheets, bars, plates, cold rolled sheets, 300 to 1999 lb.; galvanized sheets, 1 to 6 bundles; cold finished bars, 1 to 99 lbs.; SAE bars, 100 lb. Extras for size, quality, etc., apply on above quotations.

† Los Angeles, San Francisco and Seattle prices reflect special provisions of amendment No. 2 to OPA Price Schedule No. 49.

†† For zoned cities these grades have been revised to NE 8617-20.

‡ For zoned cities these grades have been revised to NE 9442-45 Ann'd.

\* Base delivered prices according to price zones established by Amendments to RPS 49 including the 3% transportation tax—not including the 6% freight increase of March 18, 1942, rescinded May 15, 1943.

\* Recommended for large sections only. Note: The extras shown above are in addition to a base price of 2.70c. per 100 lb., on finished products and \$54 per gross ton on semi-finished steel major basing points and are in cents per 100 lb. and dollars per gross ton in semi-finished. When acid open-hearth is specified and acceptable add to basic open hearth alloy differential 0.25c. per lb. for bars and bar strip, \$5.00 per gross ton for billets, blooms and slabs. The ranges shown above are restricted to sizes 100 sq. in. or less or equivalent cross sectional area 18 in. wide or under with a max. individual piece weight of 7000 lb.

## PRICES

### SEMI-FINISHED STEEL

#### Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (rerolling only). Prices delivered Detroit are \$2.00 higher; f.o.b. Duluth, billets only, \$2.00 higher; billets f.o.b. Pacific ports are \$12 higher. Delivered prices do not reflect new three per cent tax on freight rates.

	Per Gross Ton
Rerolling	\$34.00
Forging quality	40.00
Alloy steel: Pittsburgh, Chicago, Canton, Massillon, Buffalo, or Bethlehem, per gross ton	\$54.00

#### Shell Steel

	Per Gross Ton
3 in. to 12 in.	\$52.00
12 in. to 18 in.	54.00
18 in. and over	56.00
Basic open hearth shell steel, f.o.b. Pittsburgh, Chicago, Buffalo, Gary, Cleveland, Youngstown and Birmingham.	
Prices delivered Detroit are \$2.00 higher.	

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting, or quantity.

#### Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open hearth or bessemer	\$34.00

#### Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	1.90c.

#### Wire Rods

(No. 5 to 9/32 in.)

	Per Lb.
Pittsburgh, Chicago, Cleveland	2.00c.
Worcester, Mass.	2.10c.
Birmingham	2.00c.
San Francisco	2.50c.
Galveston	2.25c.

9/32 in. to 47/64 in., 0.15c. a lb. higher. Quantity extras apply.

### TOOL STEEL

(f.o.b. Pittsburgh, Bethlehem, Syracuse)

	Base per lb.
High speed	67c.
Straight molybdenum	54c.
Tungsten-molybdenum	57 1/2c.
High-carbon-chromium	43c.
Oil hardening	24c.
Special carbon	22c.
Extra carbon	18c.
Regular carbon	14c.

Warehouse prices east of Mississippi are 2c. a lb. higher; west of Mississippi 1c. higher.

### CORROSION AND HEAT-RESISTING STEEL

(Per lb. base price, f.o.b. Pittsburgh)

#### Chromium-Nickel Alloys

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25.00c.	24.00c.
Plates	29.00c.	27.00c.
Structural shapes	25.00c.	24.00c.
Sheets	36.00c.	34.00c.
Hot rolled strip	23.50c.	21.50c.
Cold rolled strip	30.00c.	23.00c.
Drawn wire	25.00c.	24.00c.

#### Straight-Chromium Alloys

	No. 410	No. 430	No. 412	No. 446
Billets	15.725c.	16.15c.	19.125c.	23.375c.
Bars	18.50c.	19.00c.	22.50c.	27.50c.
Plates	21.50c.	22.00c.	25.50c.	30.50c.
Sheets	26.50c.	29.00c.	32.50c.	36.50c.
Hot strip	17.00c.	17.50c.	24.00c.	35.00c.
Cold strip	22.00c.	22.50c.	32.00c.	52.00c.

#### Chromium-Nickel Clad Steel (20%)

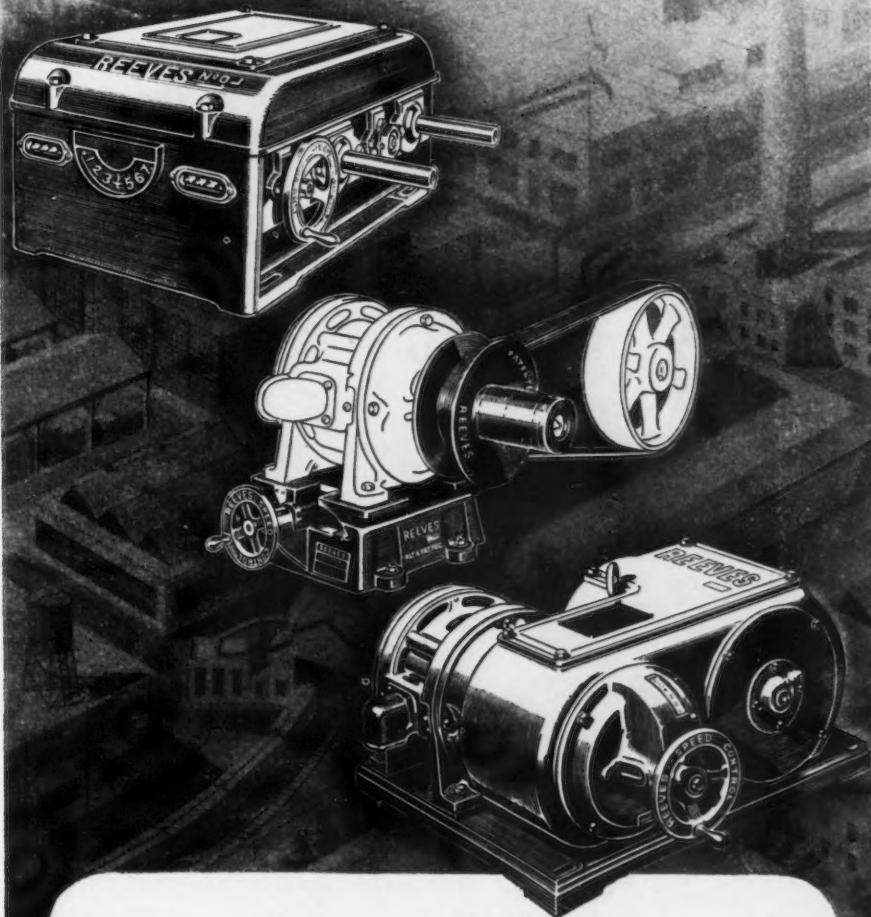
	No. 304
Plates	18.00c.*
Sheets	19.00c.

\*Includes annealing and pickling.

## TO KEEP THE MACHINES OF PRODUCTION RUNNING

AT THEIR

*Most Efficient Speeds*



● The speed of any production machine governs its efficiency. REEVES-equipped machines enable operators to secure complete speed adjustability. REEVES Speed Control provides—not just a few step speeds—but any speed between predetermined limits—can be adjusted exactly to the most efficient speed for every changing condition. Proof that REEVES offers the surest, most dependable, economical solution is found in the experience of 1,836 builders of production machines, who incorporate REEVES units as standard equipment. Other thousands of REEVES Transmissions, Motodrives and Motor Pulleys are installed annually, on machines in service. Write for Catalog IG-435.

REEVES PULLEY COMPANY, COLUMBUS, INDIANA

*Accurate-Variable*

# REEVES

## SPEED CONTROL

Keeping quality at

# Par



The use of only the highest grade scrap and pig iron obtainable goes a long way toward keeping the quality of Strong casting steel up to par. Beyond that, this quality is further safeguarded by the constant vigilance of the laboratory.

Each heat is subjected to rigid chemical and temperature checks during the refining process and a running record is kept of the chemical and physical properties of every melt.

Only from trouble-free steel can trouble-free castings be made.

STRONG IN NAME  
STRONG IN FACT

STRONG STEEL FOUNDRY COMPANY, BUFFALO, N.Y.



TENSILE STRENGTH • ELONGATION

## PRICES

### BOLTS, NUTS, RIVETS, SET SCREWS Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

#### Machine and Carriage Bolts:

	Per Cent Off List
1/2 in. & smaller x 6 in. & shorter.....	65 1/2
9/16 & 5/8 in. x 6 in. & shorter.....	63 1/2
3/4 to 1 in. x 6 in. & shorter.....	61
1 1/8 in. and larger, all length.....	59
All diameters over 6 in. long.....	59
Lag, all sizes .....	62
Plow bolts .....	65

#### Nuts, Cold Punched or Hot Pressed: (Hexagon or Square)

1/2 in. and smaller .....	62
9/16 to 1 in. inclusive.....	59
1 1/8 to 1 1/2 in. inclusive .....	57
1 3/4 in. and larger .....	56

On above bolts and nuts, excepting plow bolts, additional allowance of 10 per cent for full container quantities. There is an additional 5 per cent allowance for carload shipments.

#### Semi-Fin. Hexagon Nuts U.S.S. S.A.E.

7/16 in. and smaller.....	64
1/2 in. and smaller .....	62
1/2 in. through 1 in.....	60
9/16 to 1 in. ....	59
1 1/8 in. through 1 1/2 in....	57
1 3/4 in. and larger .....	56

In full container lots, 10 per cent additional discount.

#### Stove Bolts

Packages, nuts loose .....	71 and
In packages, with nuts attached.....	71
In bulk .....	80

On stove bolts freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago, New York on lots of 200 lb. or over.

#### Large Rivets (1/2 in. and larger)

	Base per 100 lb.
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham .....	\$3.75

#### Small Rivets (7/16 in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham .....	65 and 5

#### Cap and Set Screws

	Per Cent Off List
Upset full fin. hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in.....	64
Upset set screws, cup and oval points	71
Milled studs .....	46
Flat head cap screws, listed sizes.....	56
Fillister head cap, listed sizes .....	51

Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

### RAILS, TRACK SUPPLIES

(F.o.b. Mill)

Standard rails, heavier than 60 lb. No. 1 O.H., gross ton .....	\$40.00
Angle bars, 100 lb. ....	2.70
(F.o.b. Basing Points) Per Gross Ton	
Light rails (from billets) .....	\$10.00
Light rails (from rail steel).....	19.00
	Base per lb.
Cut spikes .....	3.00c.
Screw spikes .....	5.15c.
Tie plates, steel .....	2.15c.
Tie plates, Pacific Coast .....	2.30c.
Track bolts .....	4.75c.
Track bolts, heat treated, to railroads .....	5.00c.
Track bolts, jobbers discount .....	6.35c.

Basing points, light rails—Pittsburgh, Chicago, Birmingham; spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo; spikes alone—Youngstown, Lebanon, Pa., Richmond.

### ROOFING TERNE PLATE

(F.o.b. Pittsburgh, 112 Sheets)

	20x14 in.	20x28 in.
8-lb. coating I.C. ....	\$6.00	\$12.00
15-lb. coating I.C. ....	7.00	14.00
20-lb. coating I.C. ....	7.50	15.00

## PRICES

### ELECTRICAL SHEETS

(Base, f.o.b. Pittsburgh)

Per Lb.

Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Motor	4.95c.
Dynamo	5.65c.
Transformer 72	6.15c.
Transformer 65	7.15c.
Transformer 58	7.65c.
Transformer 52	8.45c.

F.o.b. Granite City, add 10c. per 100 lb. on field grade to and including dynamo. Pacific ports add 75c. per 100 lb. on all grades.

### WIRE PRODUCTS

To the trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham

Base per Keg

Standard wire nails	\$2.55
Coated nails	2.55
Cutnails, carloads	3.85

Base per 100 Lb.

Annealed fence wire	\$3.05
Annealed galvanized fence wire	3.40

Base Column

Woven wire fence*	67
Fence posts (carloads)	69
Single loop bale ties	59
Galvanized barbed wire†	70
Twisted barbed wire	70

\*15 1/2 gage and heavier. †On 80-rod spools in carload quantities.

### WELDED PIPE AND TUBING

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

(F.o.b. Pittsburgh only on wrought pipe) Base Price—\$200 per Net Ton

#### Steel (Butt Weld)

	Black	Galv.
1/4 in.	63 1/2	51
3/4 in.	66 1/2	55
1 to 3 in.	68 1/2	57 1/2

#### Wrought Iron (Butt Weld)

1/4 in.	25	3 1/2
3/4 in.	30	10
1 and 1 1/4 in.	34	16
1 1/2 in.	38	18 1/2
2 in.	37 1/2	18

#### Steel (Lap Weld)

2 in.	61	49 1/2
2 1/2 and 3 in.	64	52 1/2
3 1/2 to 6 in.	66	54 1/2

#### Wrought Iron (Lap Weld)

2 in.	30 1/2	12
2 1/2 to 3 1/2 in.	31 1/2	14 1/2
4 in.	33 1/2	18
4 1/2 to 8 in.	32 1/2	17

#### Steel (Butt, extra strong, plain ends)

	Black	Galv.
1/4 in.	61 1/2	50 1/2
3/4 in.	65 1/2	54 1/2
1 to 3 in.	67	57

#### Wrought Iron (Same as Above)

1/4 in.	25	6
3/4 in.	31	12
1 to 2 in.	38	19 1/2

#### Steel (Lap, extra strong, plain ends)

2 in.	59	48 1/2
2 1/2 and 3 in.	63	52 1/2
3 1/2 to 6 in.	66 1/2	56

#### Wrought Iron (Same as Above)

2 in.	33 1/2	15 1/2
2 1/2 to 4 in.	39	22 1/2
4 1/2 to 6 in.	37 1/2	21

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card. F.o.b. Gary prices are two points lower discount or \$4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or \$2 a ton higher on all butt weld.

## Lift Convey Deposit

Shepard Niles "Liftabout" general utility hoist, equipped with push-type trolley. Where accurate spotting is desired, hand-racked trolleys are recommended. Where considerable distance and fast travel speed is needed, a motor-driven trolley is an economical investment.



Motor-driven, Close Clearance or Low Head Room Hoist. Available with either push-type, hand-racked or motor-driven trolleys.

THE purpose of a hoist is to lift, convey, and deposit materials. Sounds simple, doesn't it? However, in choosing the right type of hoist for any given job, many conditions must be given thorough study.

Weights of loads, speed and distance of travel, both vertical and horizontal, as well as frequency of use are among the many factors which must first be considered for maximum hoist efficiency.

Perhaps your materials handling problem is one which requires complete coverage of a large area. If so, a Single Beam Hoist, in conjunction with a Single Beam Crane, shown above, will do the job. Or, if your requirements are for lifting only, a bolt-suspended hoist is the answer.

Whatever your materials handling problem, you may rest assured that Shepard Niles has the correct equipment for you. Put your problem up to a Shepard Niles representative.

Write for Bulletin No. 127.

**SHEPARD  
NILES**  
CRANE & HOIST CORP.

356 SCHUYLER AVENUE • MONTAUR FALLS, N. Y.

# PRICES

## PIG IRON

All prices set in bold face type are maxima established by OPA on June 24, 1941. Other domestic prices (in italics) are delivered quotations per gross ton computed on the basis of the official maxima. Delivered prices do not reflect 3 per cent tax on freight rates.

	No. 2 Foundry	Basic	Bessemer	Malleable	Low Phosphorus	Charcoal
Boston††	\$25.50	\$25.00	\$26.50	\$25.50		
Brooklyn	27.50			28.00		
Jersey City	26.53	26.03	27.53	27.03		
Philadelphia	25.84	25.34	26.84	26.34	\$30.74	
Bethlehem, Pa.	25.00	24.50	26.00	25.50		
Everett, Mass.††	25.00	24.50	26.00	25.50		
Swedeland, Pa.	25.00	24.50	26.00	25.50		
Steelton, Pa.	25.00	24.50	26.00	25.50	29.50	
Birdsboro, Pa.	25.00	24.50	26.00	25.50	29.50	
Sparrows Point, Md.	25.00	24.50	26.00	25.50		
Erie, Pa.	24.00	23.50	25.00	24.50		
Neville Island, Pa.	24.00	23.50	24.50	24.00		
Sharpville, Pa.*	24.00	23.50	24.50	24.00		
Buffalo	24.00	23.00	25.00	24.50	29.50	
Cincinnati, Ohio	23.94	23.94		25.11		
Canton, Ohio	25.39	24.89	25.89	25.39	32.69	
Mansfield, Ohio	25.94	25.44	26.44	25.94	32.86	
St. Louis	24.50	24.50				
Chicago	24.00	23.50	24.50	24.00	35.46	\$31.34
Granite City, Ill.	24.00	23.50	24.50	24.00		
Cleveland	24.00	23.50	24.50	24.00	32.42	
Hamilton, Ohio	24.00	23.50	24.50	24.00		
Toledo	24.00	23.50	24.50	24.00		
Youngstown*	24.00	23.50	24.50	24.00	32.42	
Detroit	24.00	23.50	24.50	24.00		
Lake Superior fc.					\$34.00	
Lykes, Tenn. fc.†					33.00	
St. Paul	26.76		27.26	26.76	39.80	
Duluth	24.50	24.00	25.00	24.50		
Birmingham	20.38	19.00	25.00			
Los Angeles	26.95					
San Francisco	26.95					
Seattle	26.95					
Provo, Utah	22.00	21.50				
Montreal	27.50	27.50		28.00		
Toronto	25.50	25.50		26.00		

GRAY FORGE IRON: Valley or Pittsburgh furnace .....\$23.50

\*Pittsburgh Coke & Iron Co. (Sharpville, Pa., furnace only) and the Struthers Iron and Steel Co., Struthers, Ohio, may charge 50c. a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

\*\*Pittsburgh Ferromanganese Co. (Chester furnace only) may charge \$2.25 a ton over maximum basing point prices.

†Price shown is for low-phosphorous iron; high-phosphorous sells for \$23.50 at the furnace.

††Eastern Gas & Fuel Associates, Boston, is permitted to sell pig iron produced by its selling company, Mystic Iron Works, Everett, Mass., at \$2 per gross ton above maximum prices.

Delta Chemical & Iron Co., Chicago, may charge \$30 for charcoal iron at in Delta, Mich., furnace.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50c. a ton for each 0.25 per cent silicon content in excess of base grade which is 1.75 per cent to 2.25 per cent); phosphorous differentials, a reduction of 38c. per ton for phosphorous content of 0.70 per cent and over; manganese differentials, a charge not to exceed 50c. per ton for each 0.50 per cent manganese content in excess of 1.00 per cent. Effective March 3, 1943, \$2 per ton extra may be charged for 0.5 to 0.75 per cent nickel content and \$1 per ton extra for each additional 0.25 per cent nickel.

## METAL POWDERS

Prices are based on current market prices of ingots plus a fixed figure. For ton lots f.o.b. shipping point, in cents per lb.

Copper, electrolytic, 150 and 200 mesh	21 1/2 to 23 1/2
Copper, reduced, 150 and 200 mesh	20 1/2 to 25 1/2
Iron, commercial, 100 and 200 mesh	13 1/2 to 15 1/2
Iron, crushed, 200 mesh and finer.	4c
Iron, hydrogen reduced, 300 mesh and finer	62c
Iron, electrolytic, unannealed, coarser than 300 mesh	30 to 32c
Iron, electrolytic, annealed minus 100 mesh	42c
Iron, carbonyl, 300 mesh and finer	90c
Aluminum, 100 and 200 mesh.	*23 to 27c
Antimony, 100 mesh	20.6c
Cadmium, 100 mesh	11
Chromium, 150 mesh	71.00
Lead, 100, 200 & 300 mesh, 11 1/2 to 12 1/2	51c
Manganese, 150 mesh	51c
Nickel, 150 mesh	51 1/2c
Solder powder, 100 mesh, 3 1/2c. plus metal	
Tin, 100 mesh	58 1/2c

\*Freight allowed east of Mississippi.

## BOILER TUBES

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes. Minimum Wall. Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots.

	Seamless Cold Drawn	Hot Rolled	Lap Weld Hot Rolled
1 in. o.d. 13 B.W.G.	15.03	13.04	12.30
2 1/2 in. o.d. 12 B.W.G.	20.21	17.54	16.50
3 in. o.d. 12 B.W.G.	22.48	19.50	18.30
3 1/2 in. o.d. 11 B.W.G.	28.37	24.62	23.10
4 in. o.d. 10 B.W.G.	35.20	30.54	28.00
(Extras for less carload quantities)			
40,000 lb. or ft., and over	Base		
30,000 lb. or ft. to 39,999 lb. or ft.	5%		
20,000 lb. or ft. to 29,999 lb. or ft.	10%		
10,000 lb. or ft. to 19,999 lb. or ft.	20%		
5,000 lb. or ft. to 9,999 lb. or ft.	30%		
2,000 lb. or ft. to 4,999 lb. or ft.	45%		
Under 2,000 lb. or ft.	65%		



HEAT-TREATED STEEL SHOT

We manufacture shot and grit for endurance

A shot or grit that will blast fast with a clean finish.

This is the only reason why so many operators are daily changing to our shot and grit, from Maine to California.

The unprecedented demand for our—

**HARRISON  
ABRASIVE  
CORPORATION**

Manchester, New Hampshire

HEAT-TREATED STEEL GRIT

Heat-Treated Steel Shot and Heat-Treated Steel Grit

has enabled us to expand our production and maintain a quality that is more than satisfactory to our hundreds of customers all over the country.



## PRICES

### CAST IRON WATER PIPE

*Per Net Ton*  
 6-in. and larger, del'd Chicago...\$54.80  
 6-in. and larger, del'd New York... 52.20  
 6-in. and larger, Birmingham .... 46.00  
 6-in. and larger f.o.b. cars, San Francisco or Los Angeles ..... 69.40  
 6-in. and larger f.o.b. cars, Seattle. 71.20  
 Class "A" and gas pipe, \$3 extra; 4-in. pipe is \$3 a ton above 6-in. Prices shown are for lots of less than 200 tons. For 200 tons or over, 6-in. and larger is \$45 at Birmingham and \$53.80 delivered Chicago, \$59.40 at San Francisco and Los Angeles, and \$70.20 at Seattle. Delivered prices do not reflect new 3 per cent tax on freight rates.

### LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports\*)

*Per Gross Ton*  
 Old range, bessemer, 51.50 .....\$4.75  
 Old range, non-bessemer, 51.50..... 4.60  
 Mesaba, bessemer, 51.50 ..... 4.60  
 Mesaba, non-bessemer, 51.50 ..... 4.15  
 High phosphorus, 51.50 ..... 4.35

\*Adjustments are made to indicate prices based on variance of Fe content of ores as analyzed on a dry basis by independent laboratories.

### COKE

#### Furnace

*Per Net Ton*  
 Connellsville, prompt .....\$6.50\*

#### Foundry

Connellsville, prompt ..... 7.50  
 Fayette County, W. Va. (Beehive) 8.10  
 By-product, Chicago ..... 12.25  
 By-product, New England ..... 13.75  
 By-product, Newark .... 12.40 to 12.95  
 By-product, Philadelphia ..... 12.38  
 By-product, Cleveland ..... 12.30  
 By-product, Cincinnati ..... 11.75  
 By-product, Birmingham ..... 8.50†  
 By-product, St. Louis ..... 12.02  
 By-product, Buffalo ..... 12.50

Maximum by-product coke prices established by OPA became effective Oct. 1, 1941.

\*Hand-drawn ovens using trucked coal are permitted to charge \$7.00 per net ton, plus usual transportation. Maximum beehive furnace coke prices established by OPA, Feb. 8, 1942. †F.o.b. oven.

### FLUORSPAR

Maximum price f.o.b. consumer's plant, \$30 per short ton plus either (1) rail freight from producer to consumer, or (2) rail freight from Rosclaire, Ill., to consumer, whichever is lower.

#### Exception

When the WPB Steel Division certifies in writing the consumer's need for one of the higher grades of metallurgical fluor spar specified in the table below the price shall be taken from the table plus items (1 and 2) from paragraph above.

*Base price per short ton*  
 Effective CaF<sub>2</sub> Content:  
 70% or more .....\$33.00  
 65% but less than 70% ..... 32.00  
 60% but less than 65% ..... 31.00  
 Less than 60% ..... 30.00

### REFRACTORIES

(F.o.b. Works)

#### Fire Clay Brick

*Per 1000*  
 Super-duty brick, St. Louis .....\$64.60  
 First quality, Pa., Md., Ky., Mo., Ill. 51.30  
 First quality, New Jersey ..... 56.00  
 Sec. quality, Pa., Md., Ky., Mo., Ill. 46.55  
 Second quality, New Jersey ..... 51.00  
 No. 1, Ohio ..... 43.00  
 Ground fire clay, net ton ..... 7.60

#### Silica Brick

Pennsylvania and Birmingham ...\$51.30  
 Chicago District ..... 58.90  
 Silica cement, net ton (Eastern)... 9.00

#### Chrome Brick

*Per Net Ton*  
 Standard, chemically bonded, Balt., Plymouth Meeting, Chester .....\$54.00

#### Magnesite Brick

Standard, Balt. and Chester.....\$76.00  
 Chemically bonded, Baltimore .... 65.00

#### Grain Magnesite

Domestic, f.o.b. Balt. and Chester in sacks (carloads) .....\$44.00  
 Domestic, f.o.b. Chewelah, Wash. (in bulk) ..... 22.00



## ANY METAL • ANY PERFORATION

**Industrial**—Well balanced screens of excellent material and workmanship to assure maximum screen production combined with durability.

**Ornamental**—Approved patterns and finishes including many exclusive and characteristic designs for grilles and furniture. We invite your inquiries.

The  
**Harrington & King**  
 PERFORATING CO.

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**SINCE 1854**

Catering to the needs of an exacting clientele—and that means—quality in materials, workmanship, packaging and service.

**CLARK BROS.**

can supply—standard or special fasteners in the form of bolts, nuts, screws or rivets

May we quote you on your next order?

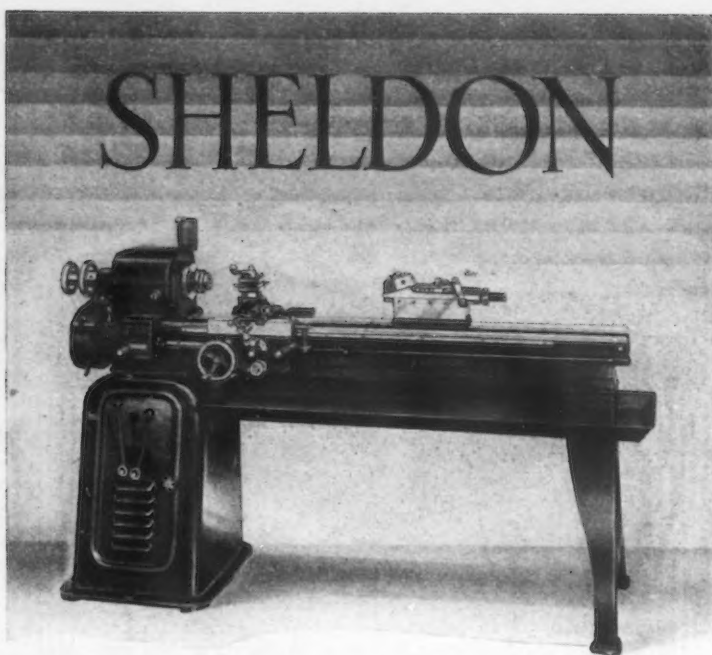
## BOLTS • NUTS • RIVETS • SCREWS



**CLARK BROS BOLT CO.**



MILLDALE, CONN.



### PRECISION TOOL ROOM AND PRODUCTION LATHES

BEST known as quality tool room lathes, SHIELDON Precision Lathes are also ideally suited for much second operation and other production work because of their extra collet capacity, sturdy construction, accuracy and available production features including: Lever operated Bed Turret, or Tool Post Turrets, Lever operated Collet Attachments, Tailstocks, Double Tool Posts, 4-speed underneath motor drives, etc. If you are looking for a 10", 11" or 12" Precision Lathe for the Tool Room or Production Line, be sure to see the SHIELDON Lathe before you order.

SHIELDON MACHINE COMPANY, INC., 4240 N. KNOX AVE., CHICAGO 41, U.S.A.

## LEE

# Quality Springs

ALL SHAPES • ALL SIZES • ALL MATERIALS

LEE SPRING COMPANY, Inc.  
30 MAIN STREET      BROOKLYN, N.Y.

### PRICES

#### Ferromanganese

78-82% manganese, maximum contract base price per gross ton, lump size, f.o.b. car at Baltimore, Philadelphia, New York, Birmingham, Rockdale, Rockwood, Tenn. Carload lots (bulk) ..... \$135.00  
Ton lots (packed) ..... 141.00  
Less ton lots (packed) ..... 148.50  
Premium, \$1.70 for each 1% above 82% Mn; penalty, \$1.70 for each 1% below 78%.

#### Electrolytic Manganese

99.9% manganese, maximum base contract price per lb. of metal, bulk, f.o.b. shipping point, with freight allowed to destination. Size, 1" x D.

	Eastern Zone	Central Zone	Western Zone
Carload lots	\$7.60c.	\$7.85c.	\$8.15c.
l.c.l. lots	\$9.60c.	\$8.60c.	\$8.65c.

#### Spiegeleisen

Maximum base contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.  
16-19% Mn 19-21% Mn 26-28% Mn  
1% max. Si 1% max. Si 1% max. Si  
Carloads \$35.00 \$36.00 \$49.50  
Less ton\* 47.50 48.50 62.00

#### Electric Ferrosilicon

OPA maximum base price cents per lb. contained Si, lump size in carlots, f.o.b. shipping point with freight allowed to destination.

	Eastern Zone	Central Zone	Western Zone
50% silicon	6.65c.	7.10c.	7.25c.
75% silicon	8.05c.	8.20c.	8.75c.

Spot sales 45c. per lb. higher for 50% Si; 30c. for 75% Si. For extras and premiums see MPR 405.

#### Silvery Iron

(Per Gross Ton, base 6.00 to 6.50 \$4)  
F.o.b. Jackson, Ohio ..... \$29.50\*  
Buffalo ..... 30.75\*

For each additional 0.50% silicon add \$1 a ton. For each 0.50% manganese over 1% add 50c. a ton. Add \$1 a ton for 0.75% phosphorus or over.

\*Official OPA price established June 24, 1941.

#### Bessemer Ferrosilicon

Prices are \$1 a ton above silvery iron quotations of comparable analysis.

#### Silicon Metal

OPA maximum base price per lb. of contained Si, lump size, f.o.b. shipping point with freight allowed to destination, for l.c.l. above 2000 lb., packed.

	Eastern Zone	Central Zone	Western Zone
96% Si, 2% Fe.	13.10c.	13.55c.	16.50c.
97% Si, 1% Fe.	13.45c.	13.90c.	16.80c.

#### Ferrosilicon Briquets

OPA maximum base price per lb. of briquet, bulk, f.o.b. shipping point with freight allowed to destination. Approximately 40% silicon.

	Eastern Zone	Central Zone	Western Zone
Car lots	3.35c.	3.50c.	3.65c.

Spot prices 1/4c. higher per lb. of briquet. For premiums and extras see MPR 405.

#### Silicomanganese

(Per gross ton, delivered, carloads, bulk)  
3.00 carbon ..... \$120.00\*  
2.50 carbon ..... 125.00\*  
2.00 carbon ..... 130.00\*  
1.00 carbon ..... 140.00\*

Briquets, contract, basis carlots, bulk freight allowed, per lb. ... 5.80c.†  
Packed ..... 6.05c.†  
Less ton lots ..... 6.65c.†

\*Spot prices are \$5 per ton higher.  
†Spot prices 1/4c. higher.

#### Ferrochrome

(65-72% Cr, 2% max. Si)  
OPA maximum base contract prices per lb. of contained Cr, lump size in carlots, f.o.b. shipping point, freight allowed to destination.

	Eastern Zone	Central Zone	Western Zone
0.03% carbon	25.00c.	25.40c.	26.00c.
0.06% carbon	23.00c.	23.40c.	24.00c.
0.10% carbon	22.50c.	22.90c.	23.50c.
1.00% carbon	20.50c.	20.90c.	21.50c.
2.00% carbon	19.50c.	19.90c.	20.50c.

Spot prices are 1/4c. higher per lb. contained Cr. For extras and premiums see MPR 407.

## PRICES

### Other Ferroalloys

Ferrotungsten, delivered, carlots, per lb. contained tungsten .....	\$1.90
Tungsten metal powder, 98%-99%, any quantity, per lb.....	\$2.60
Ferrovandium, 35%-40%, contract basis, f.o.b. producers plant, usual freight allowances, open-hearth grade, per lb. contained vanadium .....	\$2.70
Special grade .....	\$2.80
Very special grade .....	\$2.90
Vanadium pentoxide, 88%-92% V <sub>2</sub> O <sub>5</sub> , technical grade, contract basis, any quantity, per lb. contained V <sub>2</sub> O <sub>5</sub> .....	\$1.10
Ferroboreon, contract basis, 17.50% boron minimum, f.o.b. Niagara Falls, carlots, per lb. alloy.....	\$1.80
Ton lots .....	\$1.25
Silicaz No. 3, contract basis, f.o.b. Niagara Falls, all quantities, per lb. of alloy .....	23c.
Silvaz No. 3, contract basis, f.o.b. Niagara Falls, all quantities, per lb. of alloy .....	40c.
Grainal, f.o.b. Bridgeville, Pa., freight allowed 100 lb. and over, maximum based on rate to St. Louis, per lb. ....	45c.
Bortan, f.o.b. Niagara Falls	
Ton lots, per lb. ....	45c.
Less ton lots, per lb. ....	50c.
Borasil, 3% to 4% boron, 40 to 45% silicon, f.o.b. Philo, Ohio, per lb. contained boron.....	\$7.00
Ferrocolumbium, 50% to 60%, f.o.b. Niagara Falls, ton lots, per lb. contained columbium ...	\$2.25
Less ton lots .....	\$2.30
Ferrotitanium, 40%-45%, f.o.b. Niagara Falls, N. Y., ton lots, per lb. contained titanium ....	\$1.23
Less ton lots .....	\$1.25
Ferrotitanium, 20%-25%, 0.10 C max., ton lots, per lb. contained titanium .....	\$1.85
Less ton lots .....	\$1.40
High-carbon ferrotitanium, 15%-20%, 6%-8% carbon, contract basis, f.o.b. Niagara Falls, N. Y., freight allowed East of Mississippi River, North of Baltimore and St. Louis, per gross ton....	\$142.50
3%-5% carbon .....	\$157.50
Ferrophosphorus, 18% electric or blast furnace, f.o.b. Anniston, Ala., carlots, with \$3 unitage freight equalled with Rockdale, Tenn., per gross ton .....	\$58.50
Ferrophosphorus, electrolytic 23-26%, carlots, f.o.b. Monsanto (Siglo), Tenn., \$3 unitage freight equalised with Nashville, per gross ton .....	\$75.00
Ferromolybdenum, 55-75 per cent, f.o.b. Langeloth and Washington, Pa., any quantity, per lb. contained molybdenum .....	95c.
Calcium molybdate, 40%-45%, contract basis, f.o.b. Langeloth and Washington, Pa., any quantity, per lb. contained molybdenum..	80c.
Molybdenum oxide briquettes, 45%-52% Mo, f.o.b. Langeloth, Pa., per lb. contained Mo.....	80c.
Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per lb. contained Mo.....	80c.
Molybdenum powder, 99%, in 200-lb. kegs, f.o.b. York, Pa., per lb. Under 100 lb. ....	\$2.60
.....	\$3.00
Zirconium, 35-40%, contract basis, carloads in bulk or package, per lb. of alloy .....	15c.
Less ton lots .....	16c.
Zirconium, 12-15%, contract basis, carlots, bulk, per gross ton....	\$102.50
Packed .....	\$107.50
Less ton lots .....	\$112.50
Alsifer (approx. 20% Al, 40% Si and 40% Fe), contract basis, f.o.b. Niagara Falls, per lb. ...	7.50c.
Ton lots .....	8c.
Simanal (approx. 20% Si, 20% Mn, 20% Al), contract basis, f.o.b. Philo, Ohio, with freight not to exceed St. Louis rate allowed, per lb. ....	
Car lots .....	9.50c.
Ton lots .....	10.00c.
Less ton lots .....	10.50c.

## So Easy to Handle!



Woman operating Krane Kar at Army Port of Embarkation, San Francisco

New and inexperienced operators readily acquire skill and speed on the Krane Kar . . . thanks to the always-in-gear design and automatic braking in all crane operations, and the self-stabilizing feature for safety when handling loads at the sides. Write for literature.

**USERS:** American Smelting & Refining; United Engineering & Foundry; Basic Magnesium; Lockheed Aircraft; Bethlehem Steel; Carnegie-Illinois Steel; Hercules Powder; DuPont de Nemours; General Motors; Follansbee Steel; etc.

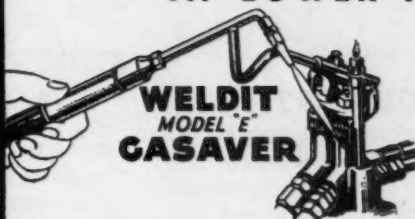
2½, 5, AND 10 TON CAPACITIES

## Krane kar

SILENT HOIST WINCH & CRANE CO., 851 63RD ST., BROOKLYN, N.Y.

## Safe Welding

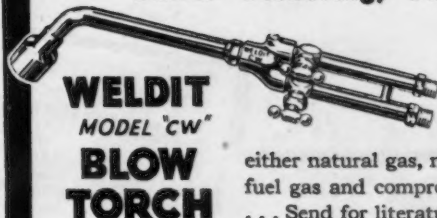
AT LOWER PRODUCTION COSTS



The Weldit Gasaver shuts off the welding flame when not in use. . . . Conserves essential materials by cutting oxygen and acetylene consumption as much as fifty per cent. Prevents injury to workmen—or sudden fires—from dangerous idle torch flames. . . . Adjustment remains unaltered between welds.

When the Weldit Gasaver has been installed, you simply hang idle torch on the handy lever rod. Weight of torch pulls rod down, thus automatically shutting off supply lines. Relight instantly by passing torch over Gasaver pilot light. No bother. . . . No time lost. . . . *No readjusting required.* . . . Price \$10.00 at Detroit. Order today.

## Better Soldering, Annealing and Heating Jobs



The Weldit Model CW Blowpipe is in daily use by many foremost industrial plants. . . . Built in accordance with the recommendations of leading fabricators of sheet metal products. . . . Operates on either natural gas, manufactured gas, or other low temperature fuel gas and compressed air. Stands up under rough shop use. . . . Send for literature.

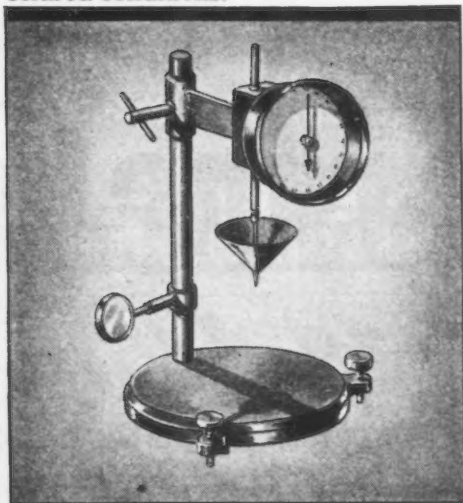
## WELDIT ACETYLENE CO.

641 BAGLEY AVENUE • DETROIT 26, MICH.

# PENETRATION

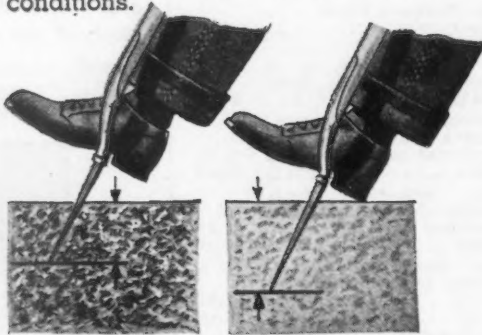
TIDEWATER LUBRICANIA

**DEFINITION:** The consistency or hardness of lubricating greases is generally expressed by the depth to which a standardized cone-shaped weight will penetrate the grease under definite prescribed conditions.



**PENETRATION TEST:** Following a carefully prescribed procedure the grease is brought to a temperature of 77°F. and the tip of the penetrometer cone is lowered until it just touches the surface of the grease. The cone is then quickly released for five seconds and the depth of travel of the cone is carefully noted. The average of five such tests at different points of the grease surface, measured in tenths of a millimeter, is reported as the Penetration or Consistency of the grease at 77°F.

If the grease was not worked before the test, it is reported as the "unworked" consistency. If the "worked" consistency is to be determined, the sample is first worked under carefully prescribed conditions.



## EXAMPLES:

A.S.T.M. "Worked"  
Consistency  
(77° F.)

Soft (No. 1) Cup Grease	310-340
Medium (No. 3) Cup Grease	220-250
Heavy (No. 4) Cup Grease	175-205
Hard (No. 6) Cup Grease	85-115

**SIGNIFICANCE:** The "worked" penetration is an indication of the tendency of the grease to leak or drip from a bearing, or its ability to flow under pressure in feed lines. However, the resistance to flow through narrow bearing clearances or the ability to support bearing loads are more nearly proportionate to the viscosity characteristics of the oil used in the manufacture of the grease. The "unworked" penetration of greases is subject to many variables and except for very hard greases has little significance.



SCIENTIFICALLY ENGINEERED  
FOR EVERY INDUSTRIAL USE

# TYCOL

**OIL IS  
AMMUNITION**  
USE IT WISELY!

**DRUMS! DRUMS! DRUMS!**  
War needs make it extremely  
important that all empty drums  
be returned immediately.